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R.I.D.E. (Reduce
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(REDUCE IMPAIRED DRIVING IN ETOBICOKE)

A Driving-While-Impaired Countermeasure Program

A FINAL 18-MONTH EVALUATION

ADDICTION RESEARCH FOUNDATION

Toronto

R.I.D.E. (Reduce Impaired Driving in Etobicoke)

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R.I.D.E. (REDUCE IMPAIRED DRIVING IN ETOBICOKE)
A DRIVING-WHILE-IMPAIRED COUNTERMEASURE PROGRAMME:
A FINAL 18-MONTH EVALUATION

by

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Executive Summary

The Reduced Impaired Driving in Etobicoke (R.I.D.E.) was a drinking-driving countermeasure programme, piloted in Etobicoke, a borough of Metropolitan Toronto and one of the five Toronto police districts (district 2). The programme was based on the concept of general deterrence and involved two components: (i) enforcement, by means of random spot-checks and road-side breath-testing that is aimed at increasing subjective and objective probabilities of risk apprehension, and (ii) public education, aimed at increasing public knowledge of drinking-driving.

The present report is an addendum to the one-year report. The results of the present report are the following.

1. During the year and one half operation, a total of 180,185 drivers were checked by R.I.D.E. In the final six months, 42,082 cars were stopped and 539 A.L.E.R.T. tests were given. Of the drivers tested, 248 (46%) passed, 163 (30%) were warned, 112 (20%) failed and 16 (3%) refused.

2. Trend analyses for the "alcohol-related" accident and injury data and proportion of all accidents and injuries considered "alcohol-related" showed statistically non-significant changes for most police districts, although the direction of the changes were generally downward. Etobicoke, however, demonstrated a nearly significant downward trend for "alcohol-related" accidents and proportion of all accidents considered "alcohol-related".

3. "Alcohol-related" and proportion of total considered "alcohol-related" accident data for Ontario Provincial Police patrolled Etobicoke and Toronto highway strips generally showed significant increases for Etobicoke and Toronto for Thursday through Saturday but not for Sunday through Wednesday.

4. Significant increases were found for "alcohol-related" accidents for one of three, and the sum of all three police divisions of Peel region, Etobicoke's western neighbour, concommitant with the R.I.D.E. programme.

5. No significant differences were found in the monthly number of impaired charges laid in districts 1, 3 and 5. However, significant increases were found in districts 2 and 4 during R.I.D.E. When the impaired charges laid by the additional R.I.D.E. officers were removed, so that the impaired charges only reflected the number of charges laid by regular officers, there was a significant decrease in number of charges laid in district 2.

6. No changes were found in B.A.L.s of suspected impaired drivers and suspected impaired accident victims.

7. No differences were found in B.A.L.s of drivers stopped in districts 1, 2, or 5 in two independent roadside surveys carried out in 1974 and 1979.

Overall, the findings of this report in combination with the findings of the earlier report suggest some positive indicators for the intermediate measures of increased knowledge on drinking driving, increased risk perception and reduction in number of impaired charges laid by regular officers. Furthermore there was an increase in the total number of impaired charges laid in Etobicoke by all officers which included the R.I.D.E. officers. These positive indicators may be considered to favour the merit of the R.I.D.E. programme, although by no means is there conclusive evidence in support of the criterion measures of a reduction of "alcohol-related" accidents and injuries or changes in B.A.L.s.

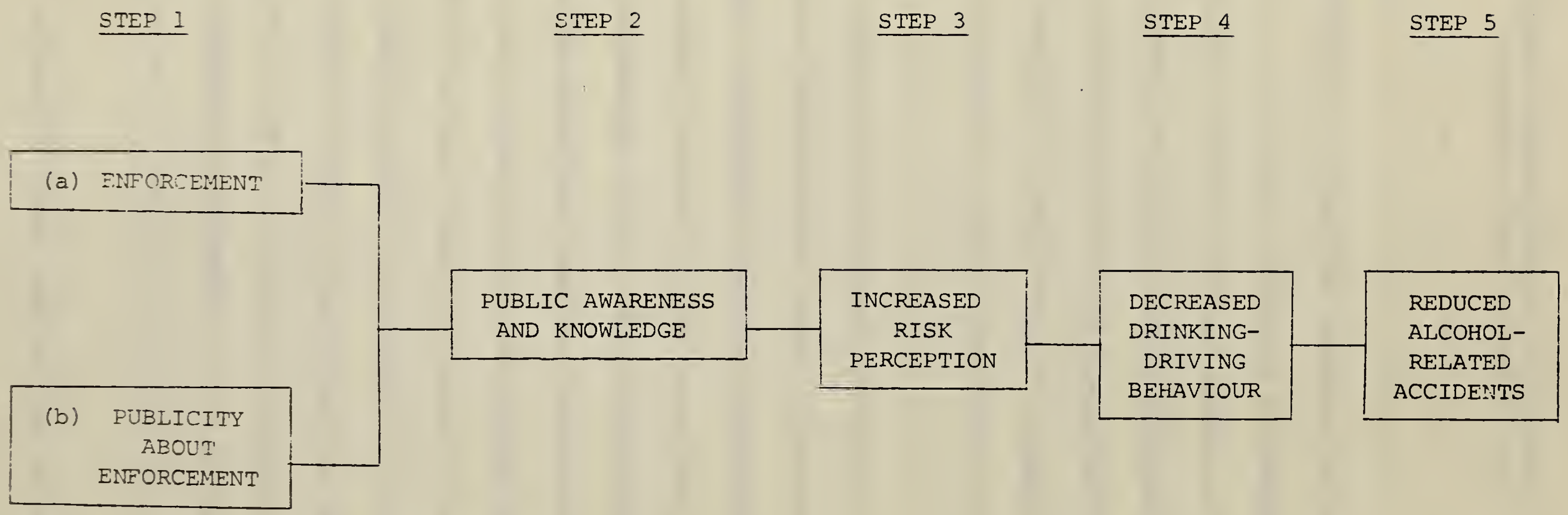
R.I.D.E. (REDUCE IMPAIRED DRIVING IN ETOBICOKE) A DRIVING-WHILE-IMPAIRED COUNTERMEASURE PROGRAMME: A FINAL EIGHTEEN MONTH EVALUATION

The Reduce Impaired Driving in Etobicoke (R.I.D.E.) was a drinking-driving countermeasure programme, piloted in Etobicoke (district 2), a borough of Metropolitan Toronto and one of five Toronto police districts. The programme was based on the concept of general deterrence and involved two components: (i) enforcement, by means of random spot-checks and road-side breathtesting that was aimed at increasing subjective and objective probabilities of risk apprehension; and (ii) public education (for greater detail see Vingilis, Salutin and Chan, 1979).

The R.I.D.E. programme was expressly designed with the chain of events which had been established to be effective in other countermeasure programmes, such as the Lackland Accident Countermeasure Experiment (Barmack and Payne, 1964), and The British Road Safety Act of 1967 (Ross, 1972). Figure 1 graphically depicts the conceptual framework, developed for the R.I.D.E. programme from Hall and O'Day (1971). In this systematic project analysis, each step of the causal link is measured. As Hall and O'Day state, "while these measures may not be politically as satisfying as dramatic life-saving claims, they have the virtue of being more realistic indicators of the success of a countermeasures programme". Public awareness, knowledge and risk perception were assessed by means of a telephone survey. Drinking-driving behaviour was assessed by means of police impaired charges, police activities questionnaire and an independent road-side survey. Finally, alcohol-related accidents were indirectly evaluated by police accident data.

This report is an addendum to the one year report (Vingilis, Salutin

FIGURE 1


STEP 1
STEP 2
STEP 3
STEP 4
STEP 5
(a) ENFORCEMENT
(b) PUBLICITY ABOUT ENFORCEMENT
PUBLIC AWARENESS AND KNOWLEDGE
INCREASED RISK PERCEPTION
DECREASED DRINKING-DRIVING BEHAVIOUR
REDUCED ALCOHOL-RELATED ACCIDENTS

and Chan, 1979). It presents information on: (i) the additional six months demographic data on drivers stopped and requested to submit to the A.L.E.R.T. (road-side breathtesting device); (ii) the trend analyses on the police collected statistics on "alcohol-related" accidents and injuries, impaired charges and blood alcohol levels (B.A.L.s) of charged drivers; (iii) the trends of the accident data for Peel region, which borders to the west of Etobicoke and for the major highways in Etobicoke (Queen Elizabeth Way (Q.E.W.), Highway 427 and Highway 401); and (iv) impaired driving data for Etobicoke and Toronto from the Independent Roadside Surveys of May 1974 and May 1979.

Evaluation of the Enforcement Component of R.I.D.E.

The programme commenced October 1, 1977 and officially terminated September 17, 1979, although data collection stopped in mid-April. For the first year, spot-checks were carried out seven days a week, two shifts a day (3 officers in 1 car for the 10.00 a.m. - 6.00 p.m. shift and 6 officers in 2 cars for the 7.00 p.m. to 3.00 a.m. shift). The two shifts were reduced to one shift after one year, due to manpower difficulties. The public, however, was not informed of this change. Starting October 1, 1978, only one shift was in operation (6 officers in 2 cars for the 7.00 p.m. to 3.00 a.m. shift). During the day however, the "R.I.D.E." cars were still used for regular patrolling duties and at least once a day, spot-checks were set up to create the impression that the day spot-checks were still in effect.

Police cars equipped with portable R.I.D.E. signs would inform motorists of the spot-checks. Drivers were randomly stopped to check for valid drivers' licences and for signs of drinking. If the officer suspected that a driver had been drinking, he was requested to submit to a breathtesting screening device, the A.L.E.R.T. (Alcohol Level Evaluation Roadside Tester). If the driver registered a failure (over 80 mg. per 100 ml.), he was taken to police headquarters for a breathalyzer, as only the readings from this more sensitive instrument are accepted as court evidence (for more complete details see Vingilis, Salutin and Chan, 1979).

General Statistics of the R.I.D.E. Programme

The present report will only be reporting on the final six months demographic data. The first year data are offered in the initial R.I.D.E. report (Vingilis, Salutin and Chan, 1979). However, the final six month data were collected during the evening shift only and, consequently, are not directly comparable to the first-year data.

During the period of October 1, 1978 to March 31, 1979, 42,082 cars were stopped by the spot-checks. Thus, during the year and a half operation, a total of 180,185 drivers have been checked by R.I.D.E.

A.L.E.R.T. Statistics

During the six month period of October 1, 1978 to March 31, 1979, a total of 539 A.L.E.R.T. tests were administered. Tables 1, 2 and 3 show the frequencies of these A.L.E.R.T. tests broken down by month, day of week and time of day.

The sex ratio was heavily biased towards men. Of those who had taken the A.L.E.R.T.s, 505 were male and 32 were female. Occasional daytime spot-check locations, from 10.00 a.m. to 2.00 p.m. were set up and during these hours 13 men (100%) were given the A.L.E.R.T. Similarly, for both 7.00 p.m. to 11.00 p.m. and 11.01 p.m. to 3.00 a.m., 94% of the A.L.E.R.T.s were administered to men.

The outcome of the A.L.E.R.T. tests and age of drivers are given in

TABLE 1

FREQUENCIES OF A.L.E.R.T. TESTS BY MONTH FROM OCTOBER 1 1978 TO MARCH 31 1979

MONTH	ABSOLUTE FREQUENCY	RELATIVE FREQUENCY %
October 1978	109	20.2
November 1978	137	25.4
December 1978	149	27.6
January 1979	56	10.4
February 1979	42	7.8
March 1979	46	8.5
	539	100.0

TABLE 2

FREQUENCIES OF A.L.E.R.T. TESTS BY DAY OF WEEK FROM OCTOBER 1 1978 to MARCH 31 1979

DAY	ABSOLUTE FREQUENCY	RELATIVE FREQUENCY %
Monday	69	12.8
Tuesday	71	13.2
Wednesday	73	13.5
Thursday	67	12.4
Friday	81	15.0
Saturday	118	21.9
Sunday	60	11.1
	539	100.0

TABLE 3

FREQUENCIES OF A.L.E.R.T. TESTS BY TIME OF DAY
FROM OCTOBER 1 1978 TO MARCH 31 1979

TIME	ABSOLUTE FREQUENCY	RELATIVE FREQUENCY %
1000 - 1400 hrs.	13	2.4
1900 - 2300 hrs.	240	44.5
2301 - 300 hrs.	278	51.6
Missing Information	8	1.5
	539	100.0

Table 4. The A.L.E.R.T. tests were given most frequently to 19, 21 and 24 year olds. Forty-five A.L.E.R.T.s were given to those aged 19, while 36 were given to each of the 21 and 24 year olds. These three ages accounted for 21.7% of all A.L.E.R.T.s given. Younger drivers (aged 30 years and under) were given disproportionately more A.L.E.R.T.s than the older drivers. Nearly 60% of all the A.L.E.R.T. tests were administered to this age group.

Approximately the same percentage of drivers within all age groups passed the A.L.E.R.T., with the exception of the 40-44 and 45-49 year age groups. These two age groups tended to have fewer drivers passing the A.L.E.R.T.s with 28.9% for the 40-44 age group and 12.9% for the 45-49 age group. This is far below the overall average of 46.1% for passing.

Table 5 depicts the borough of residence of those drivers who had taken the A.L.E.R.T. Of those tested during the six month period, 61.6% were not residents of Etobicoke.

Table 6 indicates the reasons for the investigation and test. Although 16 cars were stopped for other reasons, such as speeding, erratic driving, etc., the vast majority, 97%, were stopped by random spot-check procedures. The prime justification for A.L.E.R.T.s being given was odour, which accounted for 68.5% among all reasons.

Of the individuals who were tested on the A.L.E.R.T., 248 (46.1%) passed, 163 (30.3%) were warned, meaning that they registered between approximately 50-80 mg., 112 (20.6%) failed, and 16 (3.0%) refused.

Eighty-five percent of those tested, 458 individuals, were not charged. Of those charged, 19 were charged under the Criminal Code Section 234.1(2) for failure to provide a breath sample, 4 were charged under Section 234 C.C. for

TABLE 4

FREQUENCIES OF RESULTS FOR A.L.E.R.T. TESTS BY AGE

AGE	RESULT									
	PASS		WARN		FAIL		REFUSE		TOTAL	
	N	%	N	%	N	%	N	%	N	%
16-19	38	(55.9)	22	(32.3)	8	(11.8)	0	(0.0)	68	(12.6)
20-24	69	(46.6)	48	(32.4)	31	(21.0)	0	(0.0)	148	(27.5)
25-29	50	(52.6)	28	(29.5)	13	(13.6)	4	(4.2)	95	(17.6)
30-34	29	(42.0)	27	(39.1)	12	(17.4)	1	(1.5)	69	(12.8)
35-39	27	(53.0)	10	(19.6)	14	(27.4)	0	(0.0)	51	(9.5)
40-44	11	(28.9)	11	(28.9)	13	(34.3)	3	(7.9)	38	(7.1)
45-49	4	(12.9)	9	(29.0)	17	(54.8)	1	(3.3)	31	(5.8)
50-54	12	(52.2)	5	(21.7)	1	(4.3)	5	(21.7)	23	(4.3)
55+	8	(53.3)	3	(20.0)	2	(13.3)	2	(13.3)	15	(2.8)
Total	248	(46.1)	163	(30.3)	111	(20.6)	16	(3.0)	538	(100.0)

TABLE 5

FREQUENCIES OF A.L.E.R.T.S BY BOROUGH OF RESIDENCE FROM OCTOBER 1 1978 TO MARCH 31 1979

BROOUGH OF RESIDENCE	ABSOLUTE FREQUENCIES	RELATIVE FREQUENCIES %
Etobicoke	179	33.2
Toronto and Boroughs of York, North York and East York	140	26.0
Scarborough	12	2.2
Mississauga	86	16.0
Other	94	17.4
Missing Information	28	5.2
	539	100.0

TABLE 6

REASONS FOR INVESTIGATION TO GIVE A.L.E.R.T.s FROM OCTOBER 1 1978 TO MARCH 31 1979

REASON	ABSOLUTE FREQUENCY	RELATIVE FREQUENCY %
Spot Check Only	523	97.0
Combined Reasons	16	3.0
	539	100.0
Reason for Giving A.L.E.R.T.		
Odour	369	68.5
Speech	2	0.4
Appearance	23	4.3
Behaviour	5	0.9
Other	1	0.2
Admitted Drinking	83	15.4
Combination of Reasons	55	10.2
Missing Information	1	0.2
	539	100.0

driving while ability impaired, 7 were charged under Section 235(2) C.C. for failure/refusal to accompany Peace Officer, 35 were charged under Section 236 C.C. for being over 80 mg. while driving, 3 were charged with other unspecified offences and information was missing for 13 cases.

The blood alcohol level of those who had failed the A.L.E.R.T. and then were later tested on a breathalyzer are presented in Table 7. Almost four and one-half percent of those who had failed the A.L.E.R.T. subsequently passed the breathalyzer. Such error may be due to either the interval between the A.L.E.R.T. and the breathalyzer or failure with the A.L.E.R.T. device.

Tables 8 and 9 present the results of the A.L.E.R.T. tests by month and the lowest blood alcohol level of those who failed the A.L.E.R.T. by month, respectively. Overall no apparent patterns emerged within the six-month period.

Criterion Measure for the Enforcement Component

The selection of an appropriate criterion measure is always a major evaluation problem. Ideally, the best measure would be the number of accidents caused by drivers with high B.A.L.s at the time of the accidents. Unfortunately, these data are not available since B.A.L. measurements are taken for only a portion of fatally injured drivers and rarely on surviving drivers involved in accidents.

Others (Levy, Voas, Johnson and Klein, 1978) alternatively use night-time and daytime fatal accidents, which takes advantage of the well documented relationship between time of day, drinking and alcohol-related accidents. However, exceedingly few fatalities occur in Toronto, so that it was not possible to employ this more rigorous criterion measure.

Thus, the only available and employable data were the total "alcohol-

TABLE 7

LOWEST B.A.L.s IN MGMs OF THOSE WHO FAILED THE A.L.E.R.T. AND WERE TESTED ON A BREATHALYZER

MGM	ABSOLUTE FREQUENCY	RELATIVE FREQUENCY %
20	1	0.9
50	4	3.8
60	3	2.8
70	5	4.7
80	10	9.4
85	2	1.9
87	1	0.9
90	17	16.0
97	1	0.9
100	7	6.6
110	2	1.9
120	15	14.2
130	7	6.6
140	9	8.5
150	7	6.6
170	2	1.9
180	5	4.7
190	4	3.8
200	2	1.9
210	1	0.9
230	1	0.9
	106	100.0

TABLE 8

FREQUENCIES OF RESULTS FOR A.L.E.R.T. TESTS BY MONTH

MONTH	RESULT									
	PASS		WARN		FAIL		REFUSE		TOTAL	
	N	%	N	%	N	%	N	%	N	%
October 1978	46	(42.2)	31	(28.4)	29	(26.6)	3	(2.8)	109	(20.2)
November 1978	64	(46.7)	43	(31.4)	24	(17.5)	6	(4.4)	137	(25.4)
December 1978	76	(51.0)	36	(24.2)	35	(23.5)	2	(1.3)	149	(27.6)
January 1979	24	(42.9)	18	(32.1)	12	(21.4)	2	(3.6)	56	(10.4)
February 1979	21	(50.0)	15	(35.7)	5	(11.9)	1	(2.4)	42	(7.8)
March 1979	17	(37.0)	20	(43.5)	7	(15.2)	2	(4.3)	46	(8.5)
	248	(46.0)	163	(30.2)	112	(20.8)	16	(3.0)	539	(100.0)

TABLE 9

B.A.L.s OF THOSE WHO FAILED THE A.L.E.R.T.S. BY MONTH

MONTH	LOWEST B.A.L. IN MGM											
	10-49	50-80	81-100	101-120	121-140	141-160	161-180	191-200	201-220	221-240	241-260	TOTAL
	%	%	%	%	%	%	%	%	%	%	%	%
October 1978	1 (3.7)	7 (25.9)	11 (40.7)	1 (3.7)	2 (7.4)	1 (3.7)	4 (14.8)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	27 (25.5)
November 1978	0 (0.0)	3 (14.3)	3 (14.3)	5 (23.8)	2 (9.5)	4 (19.0)	2 (9.5)	2 (9.5)	0 (0.0)	0 (0.0)	0 (0.0)	21 (19.8)
December 1978	0 (0.0)	10 (28.5)	6 (17.1)	8 (22.9)	6 (17.1)	1 (2.9)	0 (0.0)	4 (11.4)	0 (0.0)	0 (0.0)	0 (0.0)	35 (33.0)
January 1979	0 (0.0)	2 (16.6)	3 (25.0)	1 (8.3)	3 (25.0)	0 (0.0)	1 (8.3)	0 (0.0)	1 (8.3)	1 (8.3)	0 (0.0)	12 (11.3)
February 1979	0 (0.0)	0 (0.0)	1 (25.0)	1 (25.0)	2 (50.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	4 (3.8)
March 1979	0 (0.0)	0 (0.0)	4 (57.1)	1 (14.4)	1 (14.3)	1 (14.3)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	7 (6.6)
	1 (0.9)	22 (20.7)	28 (26.3)	17 (16.1)	16 (15.1)	7 (6.6)	7 (6.6)	6 (5.7)	1 (0.9)	1 (0.9)	0 (0.0)	106 (100.0)

related" accidents and injuries. The problems with identifying "alcohol-related" accidents through police investigator judgements have been discussed more completely elsewhere (Edelman and Walker, 1978; U.S. Dot, 1972; Zylman, 1974). It is important to realize, however, that these accident and injury data only reflect police perceptions of alcohol-relatedness and may be subject to many sources of bias. However, it was hoped that the police data would demonstrate some trends with regard to the R.I.D.E. intervention.

Statistics on Police Reported Total and "Alcohol-Related" Accidents

Police report data were gathered on total and "alcohol-related" accidents and injuries for all five police traffic districts from 1972 to April 1979. The data consisted of 75 pre-intervention observations and 21 intervention observations.

These data were considered to fit a basic time-series quasi-experimental design. This type of design involves some number of repeated observations of an outcome variable across time with an intervention, introduced between two observations (Glass, Wilson and Gottman, 1974). Generally, time series analysis is applied to these types of data because dependence among observations is a most common phenomenon. Before-after studies of the effects of a new drinking-driving countermeasure programme may be invalidated by the failure to detect and correct for autocorrelation (dependence) in the accident data. Frequently, autocorrelation results from annual cycles or seasonality in accident frequencies. It may also result from longer term trends that affect collision levels, such as population growth or decline or changes in vehicle miles travelled (Levy, Voas, Johnson and Klein, 1978). Time Series Analysis identifies characteristics such as seasonality, annual cycles, etc. by using the autocorrelation function. These time series characteristics are "removed" from the data so that the real impact of the intervention can be evaluated. The accident series are divided into two components, the time series effects and the intervention effects. The final model estimates both components. This statistical model was chosen as the appropriate statistical procedure to be used for the police accident figures.

Absolute Numbers of "Alcohol-Related" Accidents

The absolute numbers of police reported "alcohol-related" accidents for the 5 districts for the 13 police reporting periods (P.R.P.) per year (28 days in length), for the years 1972 to April, 1979 were employed in the analyses. The data for the six-month extension, October 1, 1978 to April, 1979 are presented in Table 10. The trends for 1976 to 1979 for the 5 police districts are graphically depicted in Figures 2 to 6.

The raw data of the police reported "alcohol-related" accident figures were subjected to autocorrelation analyses, to determine the degree of relatedness among the accident figures. Only districts 1 and 5 had autocorrelations sufficiently high to warrant the use of time series analysis. The time series analysis showed a significant downward trend for district 1 ($t = 2.83$, $p < .01$, level change = -12.53) and no significant difference for district 5 ($t = .14$, $p > .05$, level change = -.96). Since the autocorrelations were low for the other three districts, the data were subjected to t-tests. Districts 2 and 3 showed no significant differences between pre-intervention and intervention accident data; district 2 ($t = 1.73$, $df = 94$, $p < .1$) and district 3 ($t = .16$, $df = 94$, $p > .05$) although district 2 did show a downward trend. District 4, however, demonstrated a significant upward trend ($t = 4.59$, $df = 94$, $p < .001$).

TABLE 10

FREQUENCIES OF "ALCOHOL-RELATED" ACCIDENTS BY DISTRICT AND POLICE REPORTING PERIOD (PRP) FOR SEPTEMBER 1978 - APRIL 1979

YEAR PRP	DISTRICT					
	1	2	3	4	5	TOTAL
1978						
11	89	52	61	67	117	386
12	84	58	72	89	140	443
13	63	42	72	78	92	347
1979						
1	80	57	61	87	123	408
2	68	57	70	84	113	392
3	76	63	55	77	131	402
4	56	47	56	72	95	326

FIGURE 2

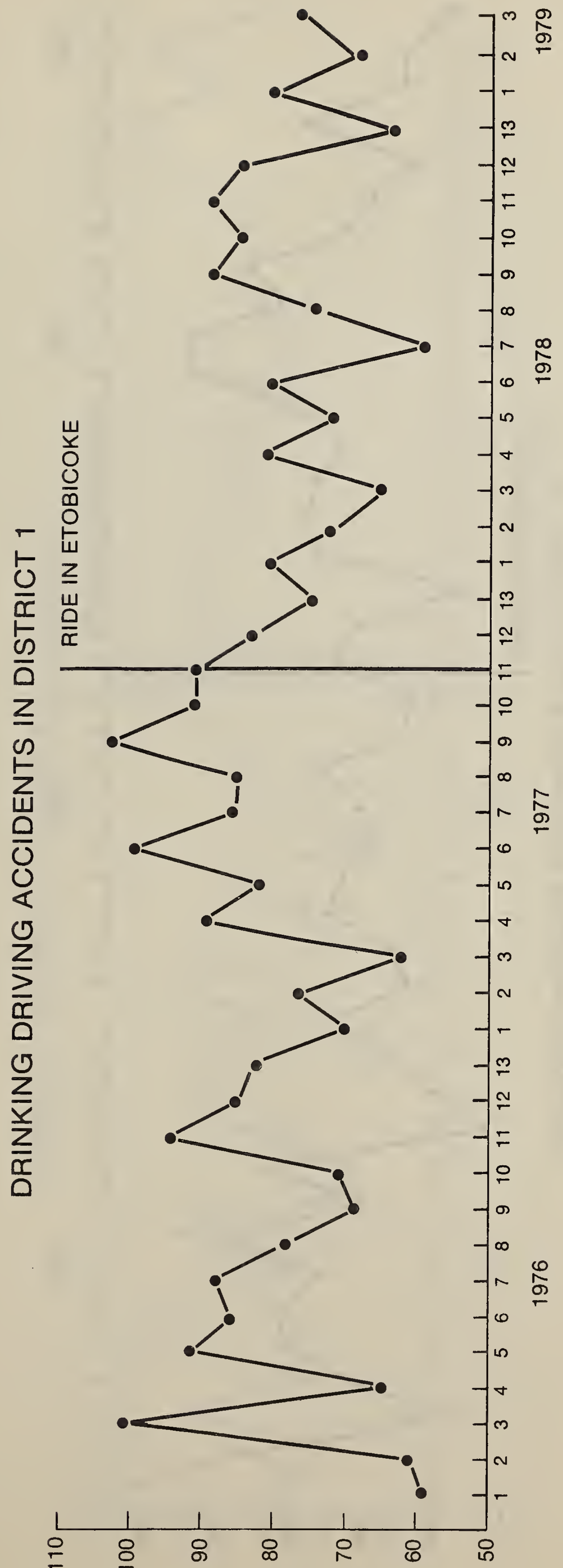

DRINKING DRIVING ACCIDENTS IN DISTRICT 1
RIDE IN ETOBICOKE
110
100
90
80
70
60
50
1 2 3 4 5 6 7 8 9 10 11 12 13
1976
1 2 3 4 5 6 7 8 9 10 11 12 13
1977
1 2 3 4 5 6 7 8 9 10 11 12 13
1978
1 2 3
1979

FIGURE 3

DRINKING DRIVING ACCIDENTS IN DISTRICT 2

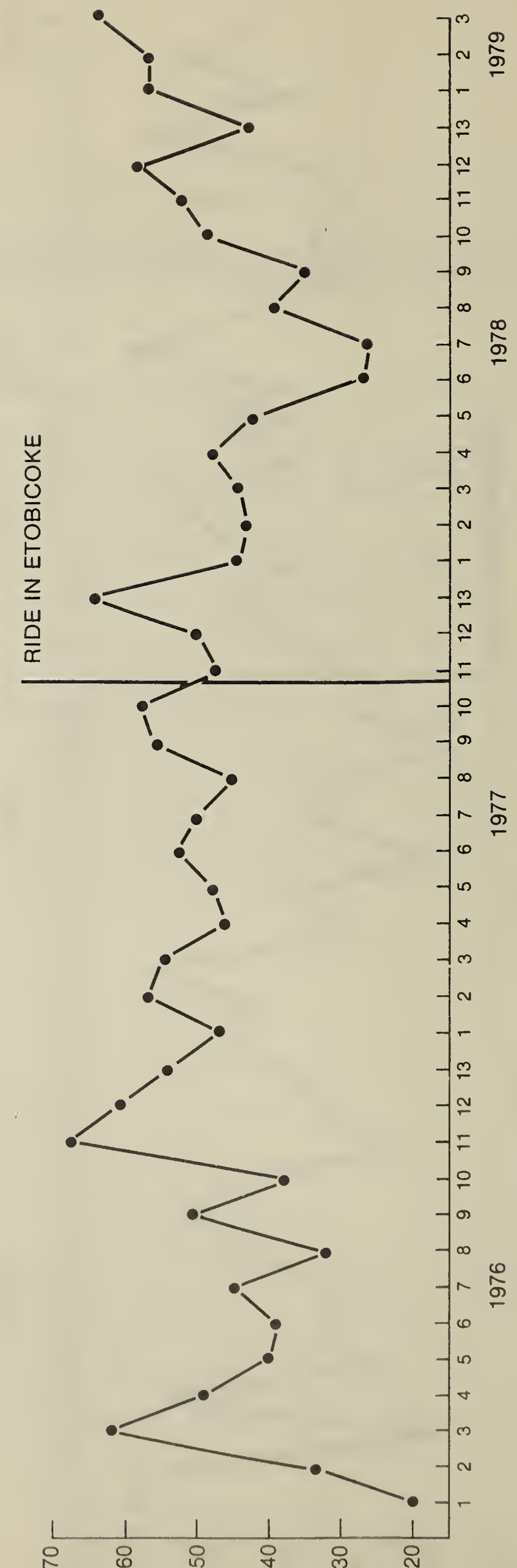


FIGURE 4

DRINKING DRIVING ACCIDENTS IN DISTRICT 3

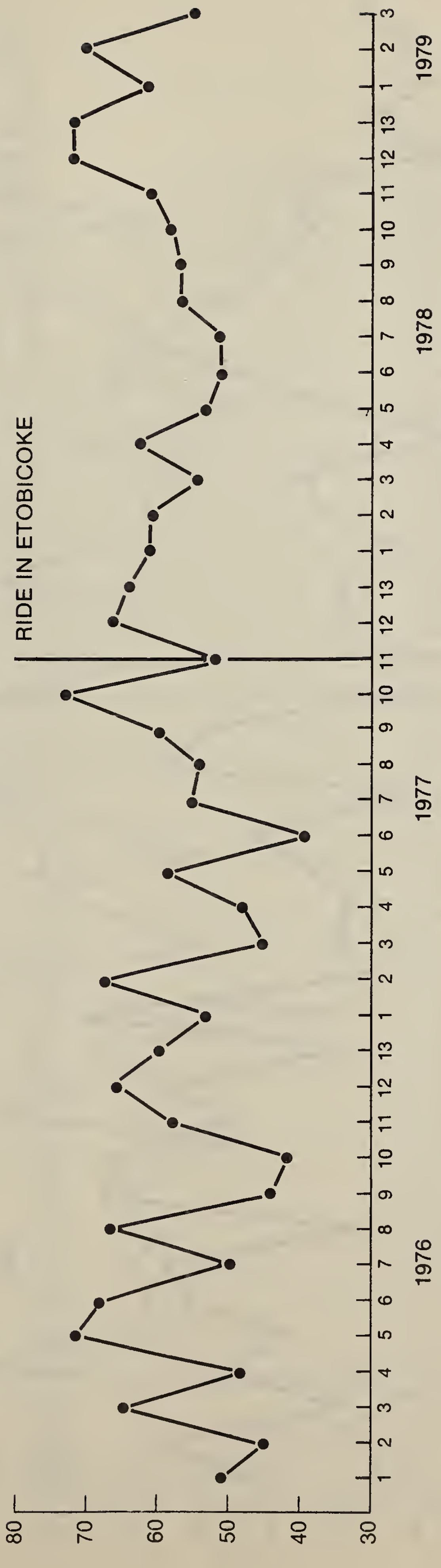


FIGURE 5

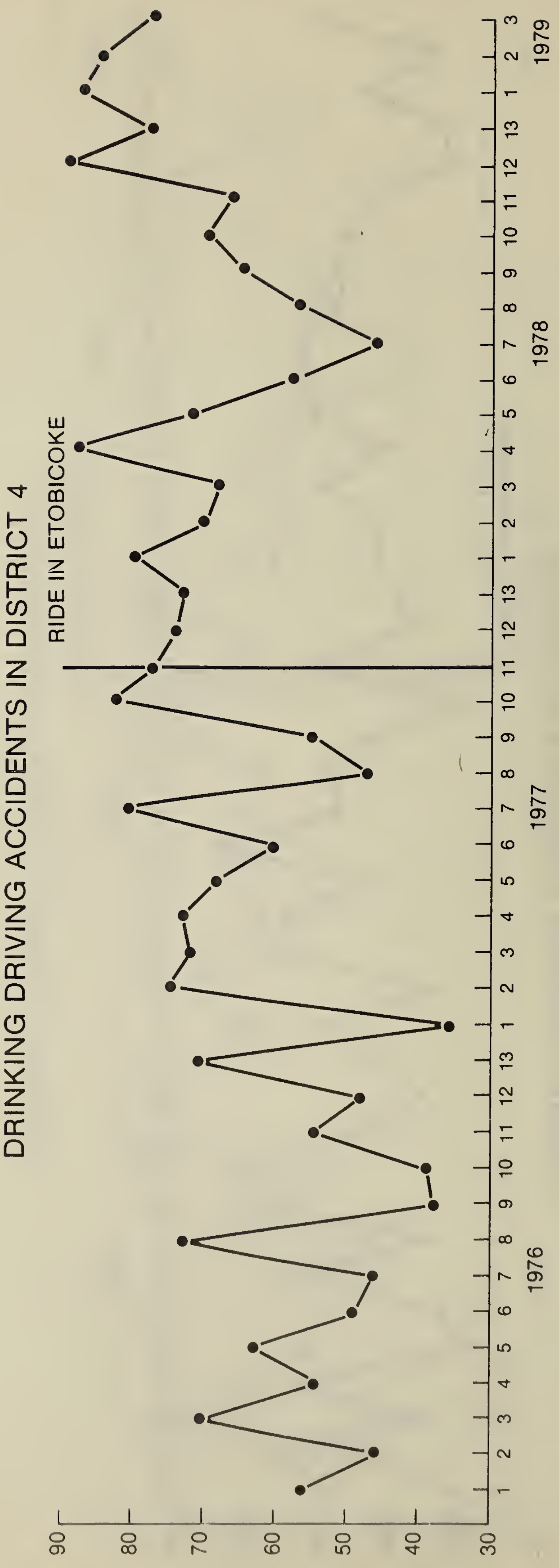
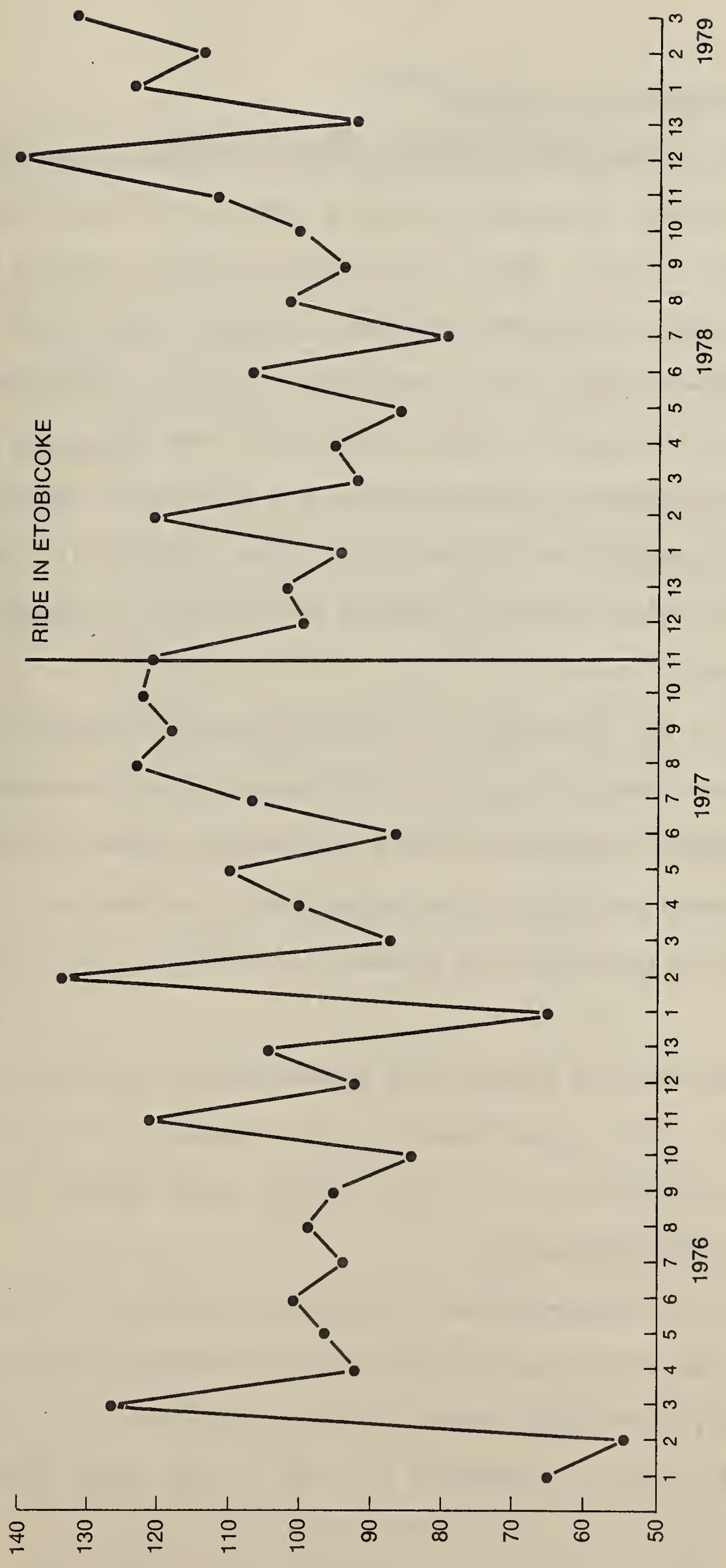

DRINKING DRIVING ACCIDENTS IN DISTRICT 4
RIDE IN ETOBICOKE
90
80
70
60
50
40
30
1 2 3 4 5 6 7 8 9 10 11 12 13
1976
1 2 3 4 5 6 7 8 9 10 11 12 13
1977
1 2 3 4 5 6 7 8 9 10 11 12 13
1978
1 2 3
1979

FIGURE 6



DRINKING DRIVING ACCIDENTS IN DISTRICT 5

Proportion of Total Accidents

One of the problems, however, with absolute accident figures is that the fluctuations in "alcohol-related" accidents could be a reflection of the fluctuations of the total accident figures. These total accident figures could be affected by such factors as weather conditions, changes in traffic volume, etc. The proportion of the total accidents that are considered to be "alcohol-related" would be less subject to change and large variations. The proportion of total accidents that were reported as alcohol-related for each police reporting period for each district for the six-month extension is given in Table 11. The proportion of alcohol-related accidents for each district for 1977-1979 is graphically represented in Figures 7 to 11.

The data for the proportion of "alcohol-related" accidents for the five districts for the years 1972 to April 1979 were similarly subjected to autocorrelation analysis. Districts 2 and 4 were found to have low autocorrelations for which t-tests were found to be insignificant for district 4 ($t = 1.35$, $df = 94$, $p > .05$) and insignificant but downward for district 2 ($t = 1.74$, $df = 94$, $p < .1$).

Time series analyses demonstrated nonsignificant differences for district 1 ($t = .61$, $p > .05$, level change = -.26), district 3 ($t = .26$, $p > .05$, level change = .13) and district 5 ($t = .01$, $p > .05$, level change - .01).

"Alcohol-Related" Injuries

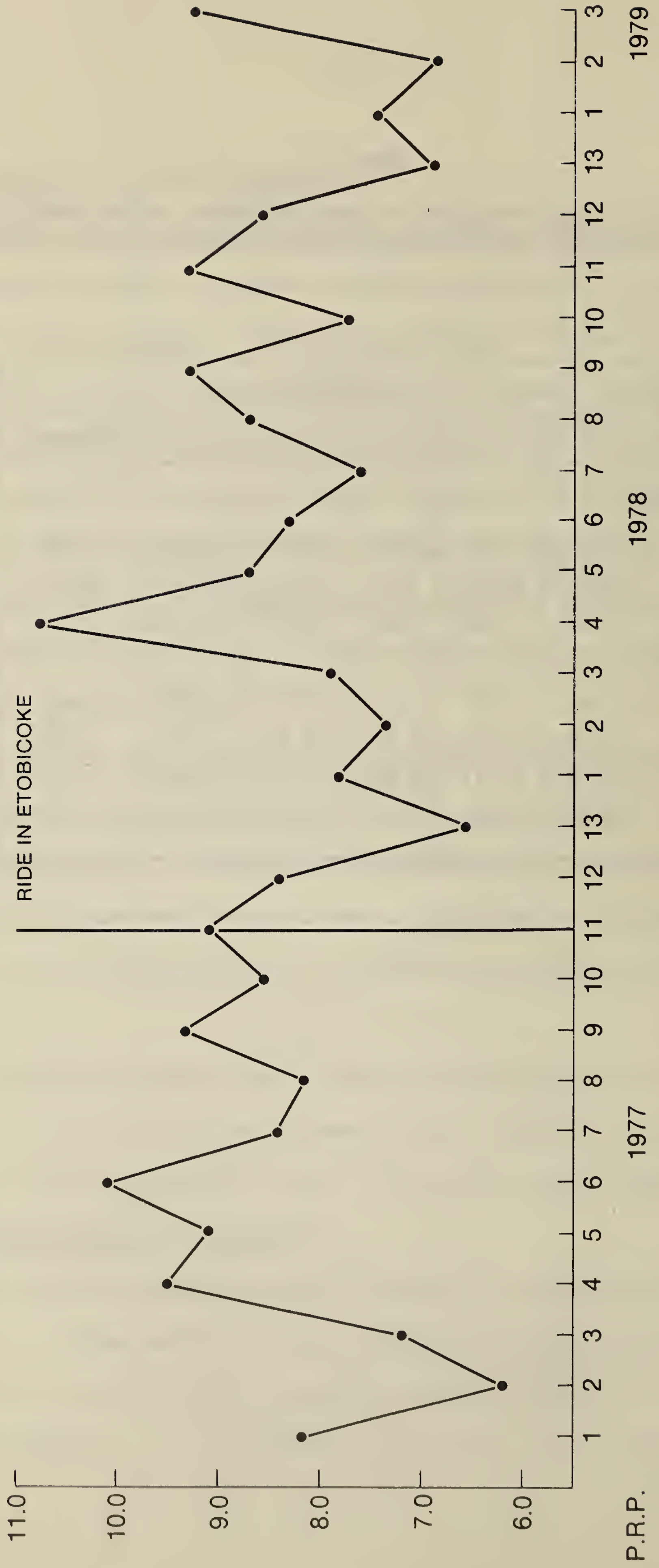
The data for "alcohol-related" injuries are presented in Table 12 and Figures 12 to 16. Time Series Analyses indicated no significant differences for district 1 ($t = .73$, $p > .05$, level change = -3.01), district 2 ($t = 1.19$, $p > .05$, level change = -2.71), district 3 ($t = .62$, $p > .05$, level change = -2.25),

TABLE 11

PROPORTION OF ACCIDENTS THAT ARE "ALCOHOL-RELATED" (% OF TOTAL ACCIDENTS) BY DISTRICT AND POLICE REPORTING PERIOD FOR SEPTEMBER 1978 - APRIL 1979.

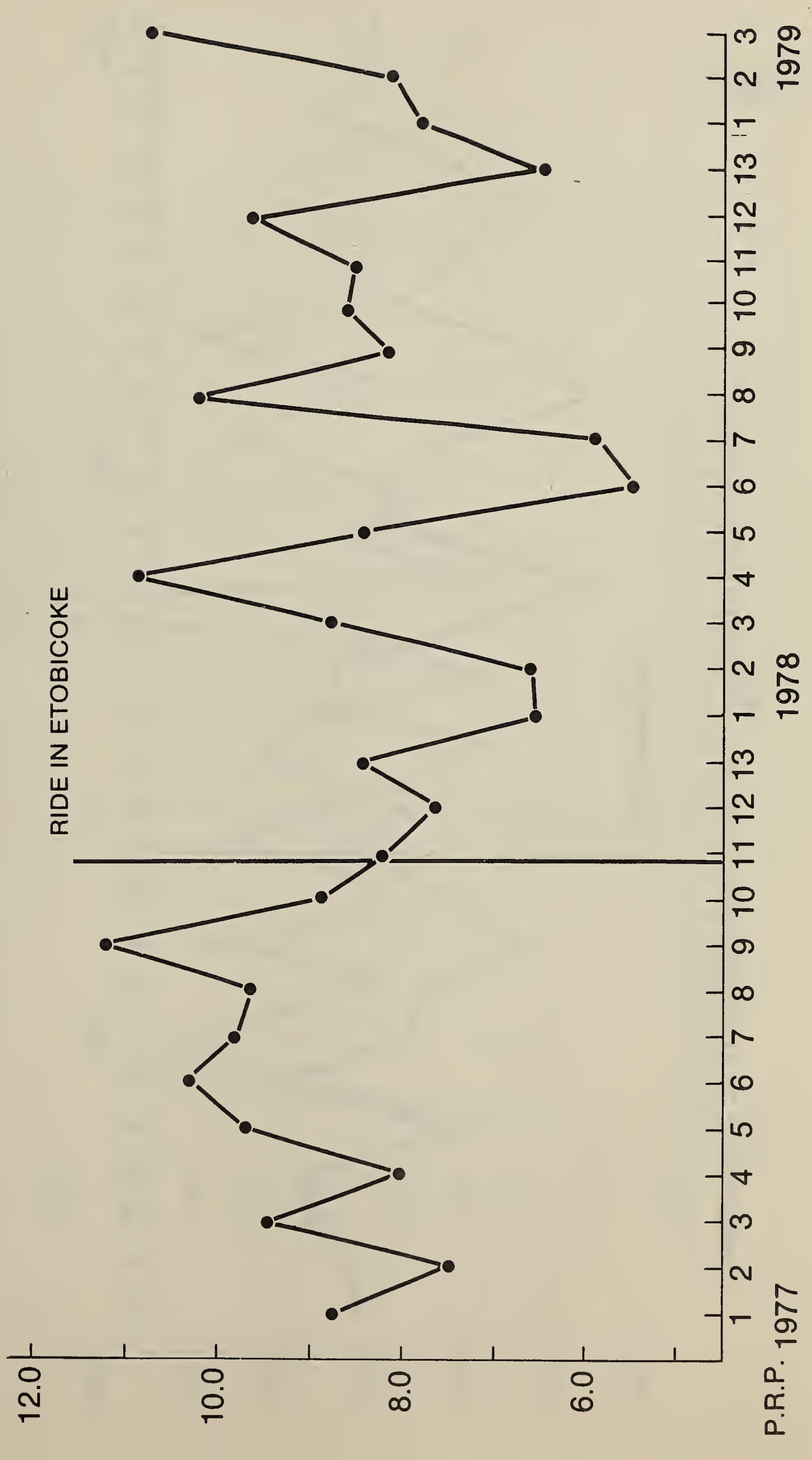
YEAR PRP	DISTRICT 1	2	3	4	5	AVERAGE
1978						
11	9.29	9.61	6.85	10.39	10.40	9.28
12	8.55	10.58	7.57	13.19	11.53	10.13
13	6.88	7.41	6.82	10.57	8.12	7.87
1979						
1	7.42	8.77	5.38	10.54	9.95	8.28
2	6.84	9.05	5.71	10.65	8.53	7.90
3	9.20	11.71	5.89	11.80	11.49	9.83
4	8.20	11.00	7.72	14.26	10.09	9.94

FIGURE 7



PERCENTAGE OF ACCIDENTS THAT ARE "ALCOHOL RELATED" IN DISTRICT 1

FIGURE 8



PERCENTAGE OF ACCIDENTS THAT ARE "ALCOHOL RELATED" IN DISTRICT 2

FIGURE 9

PERCENTAGE OF ACCIDENTS THAT ARE "ALCOHOL RELATED" IN DISTRICT 3

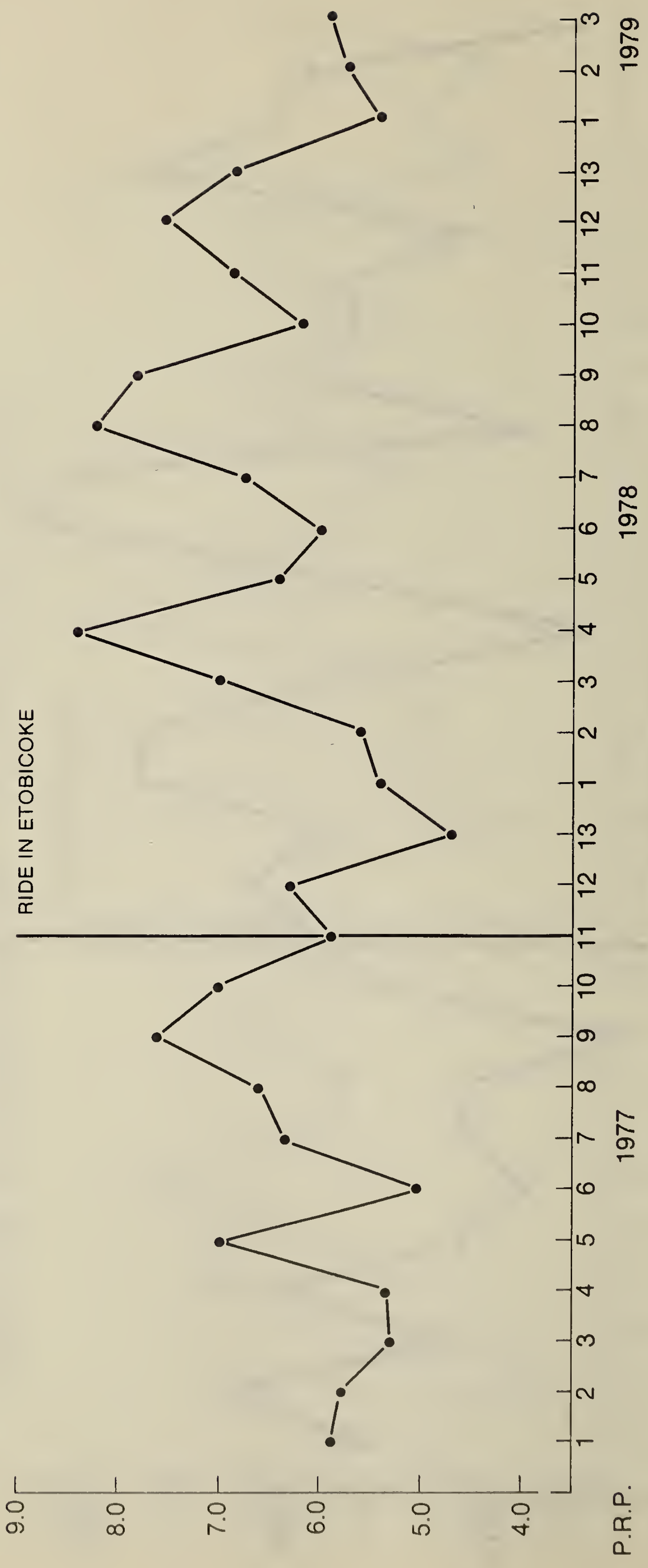


FIGURE 10

PERCENTAGE OF ACCIDENTS THAT ARE "ALCOHOL RELATED" IN DISTRICT 4

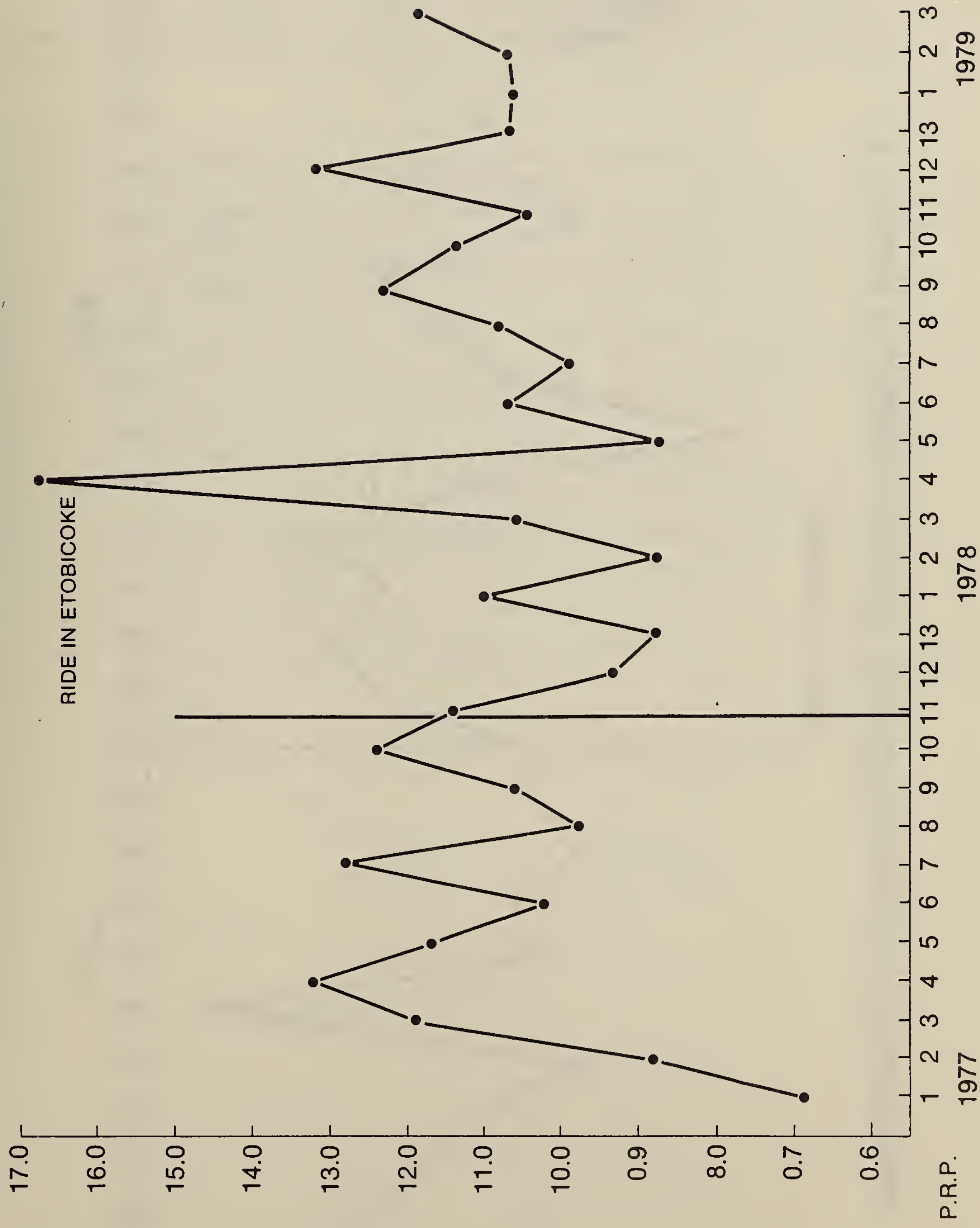


FIGURE 11

PERCENTAGE OF ACCIDENTS THAT ARE "ALCOHOL RELATED" IN DISTRICT 5

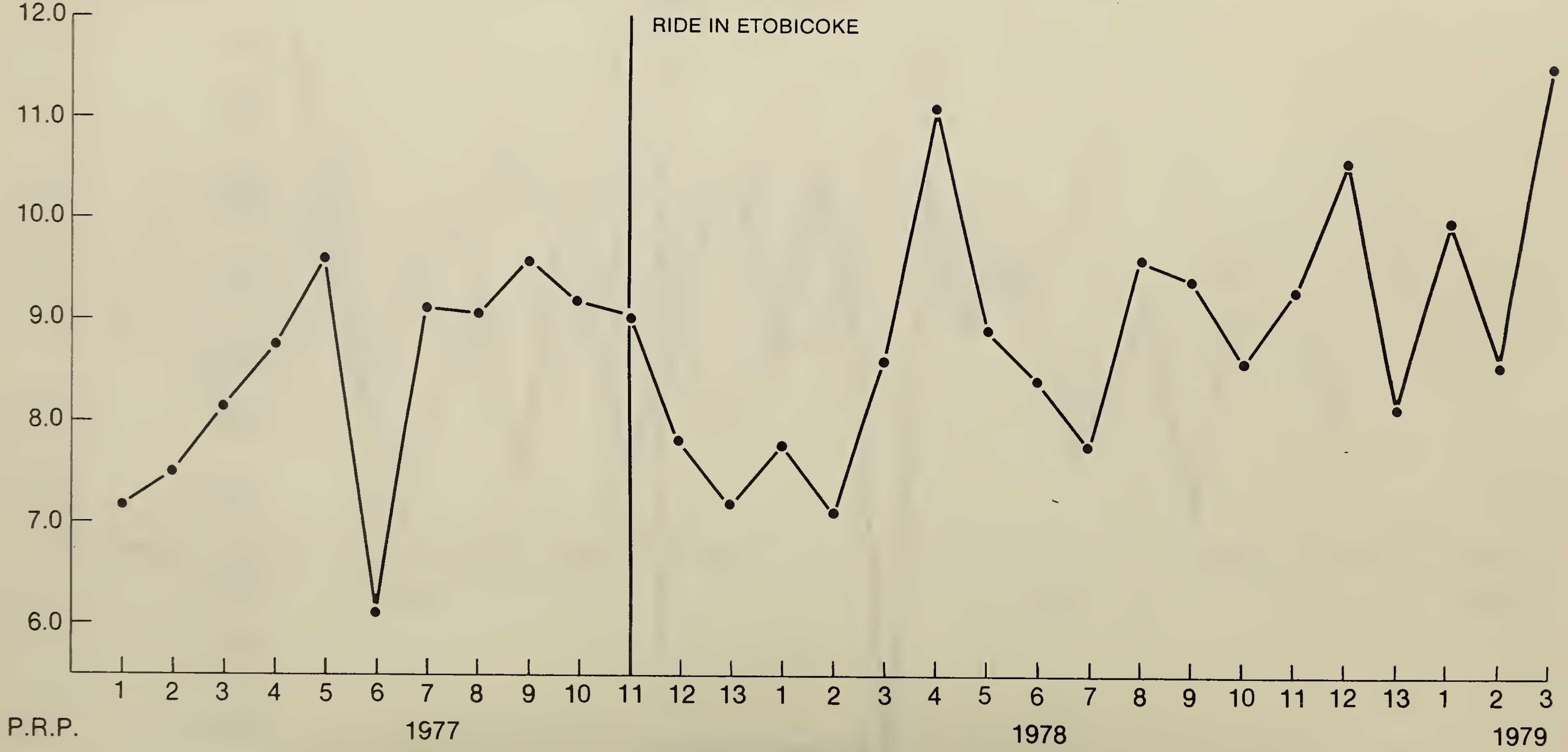
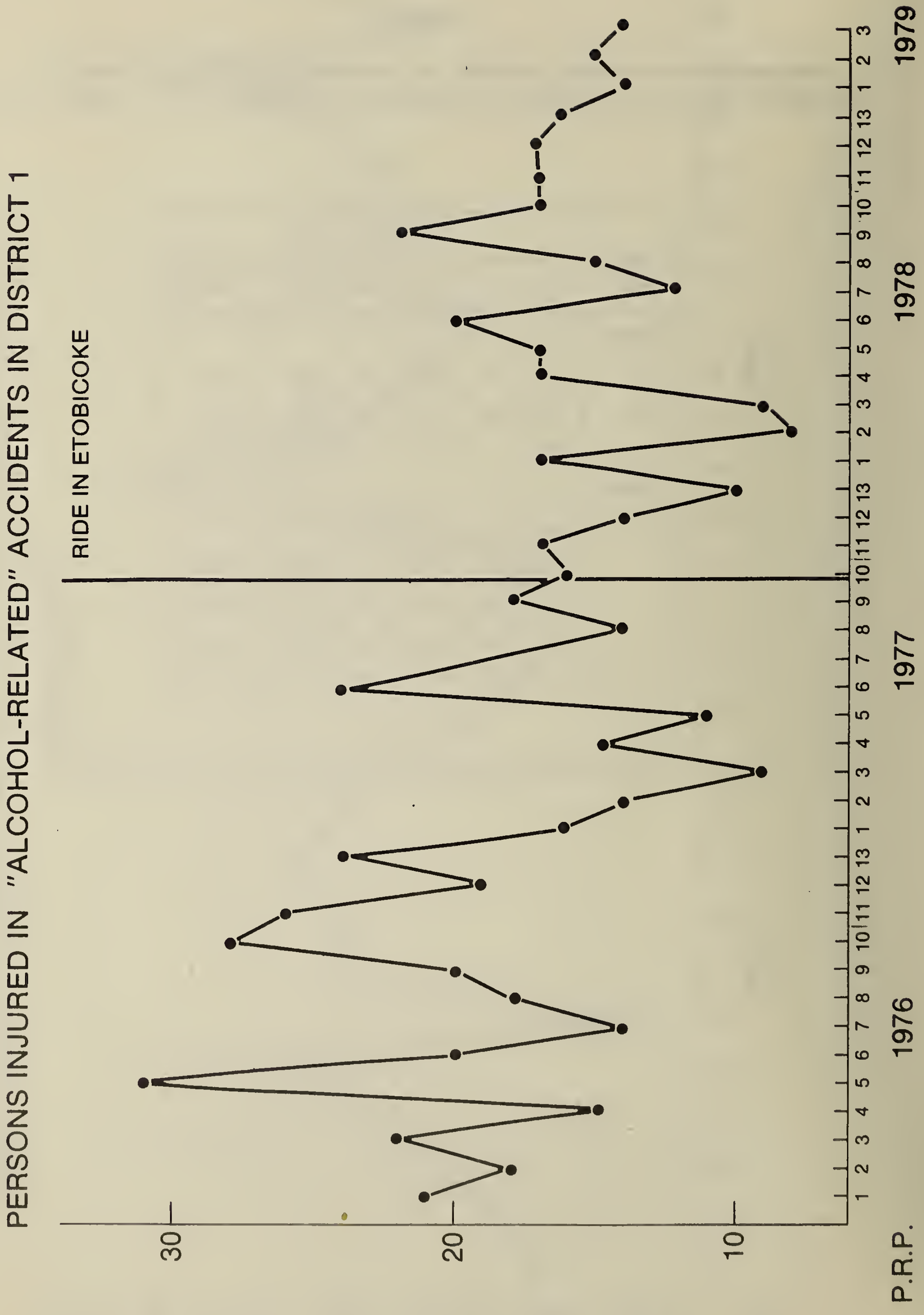


TABLE 12

FREQUENCIES OF PERSONS INJURED IN "ALCOHOL-RELATED ACCIDENTS BY DISTRICT AND POLICE REPORTING PERIOD FOR SEPTEMBER 1978 - APRIL 1979

YEAR PRP	DISTRICT					
	1	2	3	4	5	TOTAL
1978						
11	17	15	14	26	26	98
12	17	11	15	24	24	91
13	16	5	16	19	19	75
1979						
1	14	15	8	15	27	79
2	15	13	22	16	22	88
3	14	16	10	13	26	79
4	12	11	13	15	23	74

FIGURE 12



PERSONS INJURED IN "ALCOHOL-RELATED" ACCIDENTS IN DISTRICT 1

FIGURE 13

PERSONS INJURED IN "ALCOHOL-RELATED" ACCIDENTS IN DISTRICT 2

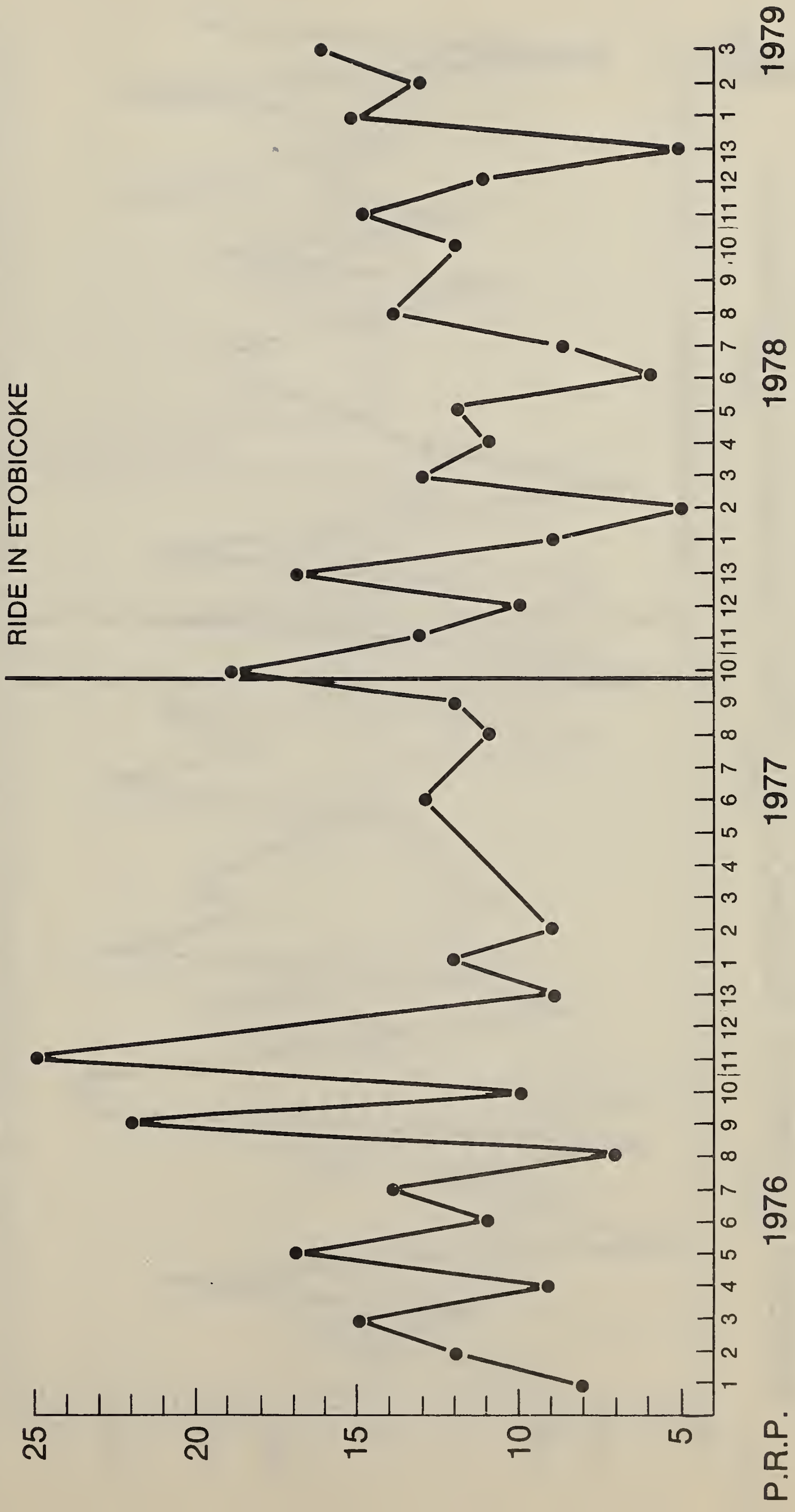


FIGURE 14

PERSONS INJURED IN "ALCOHOL-RELATED" ACCIDENTS IN DISTRICT 3

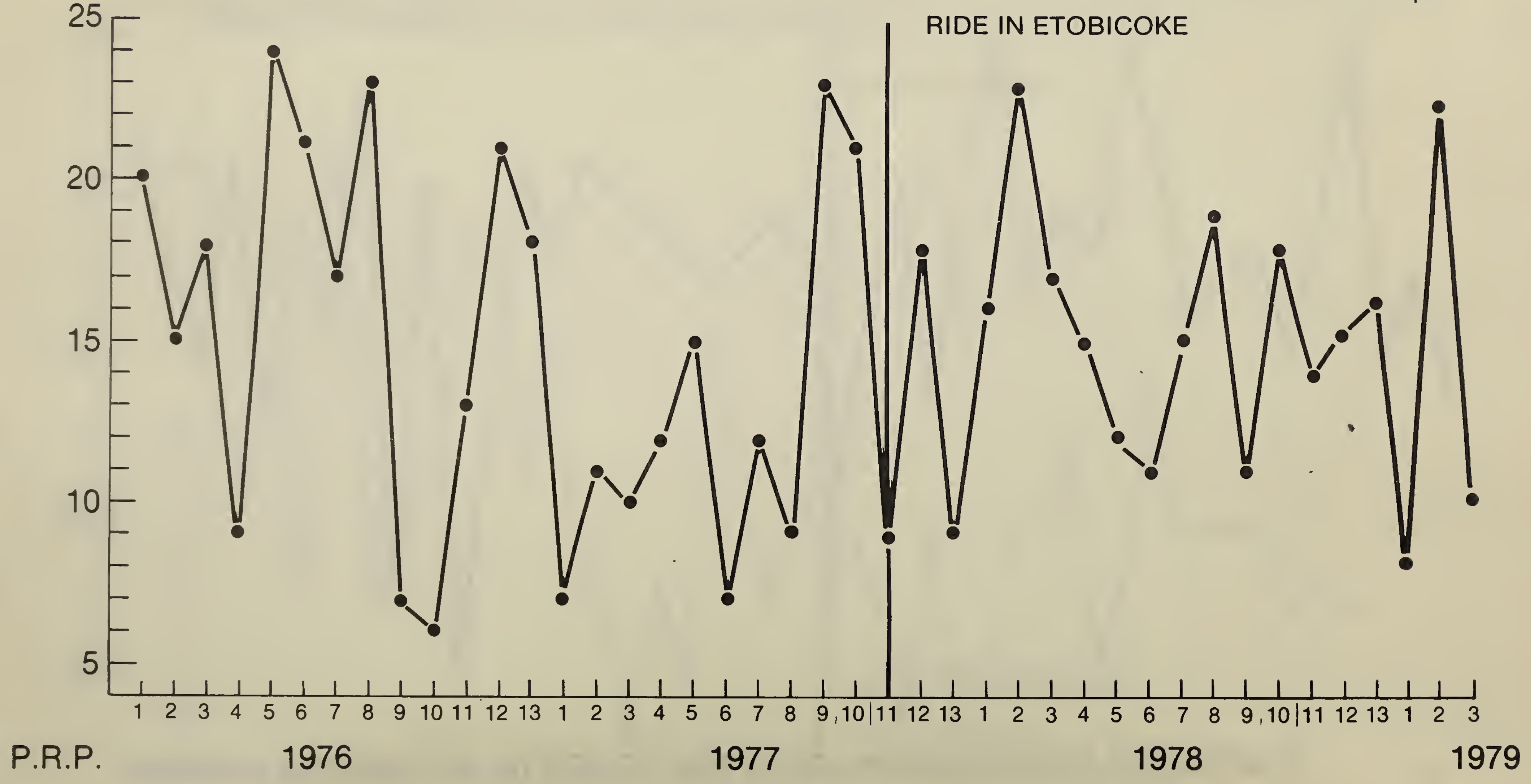


FIGURE 15

PERSONS INJURED IN "ALCOHOL-RELATED" ACCIDENTS IN DISTRICT 4

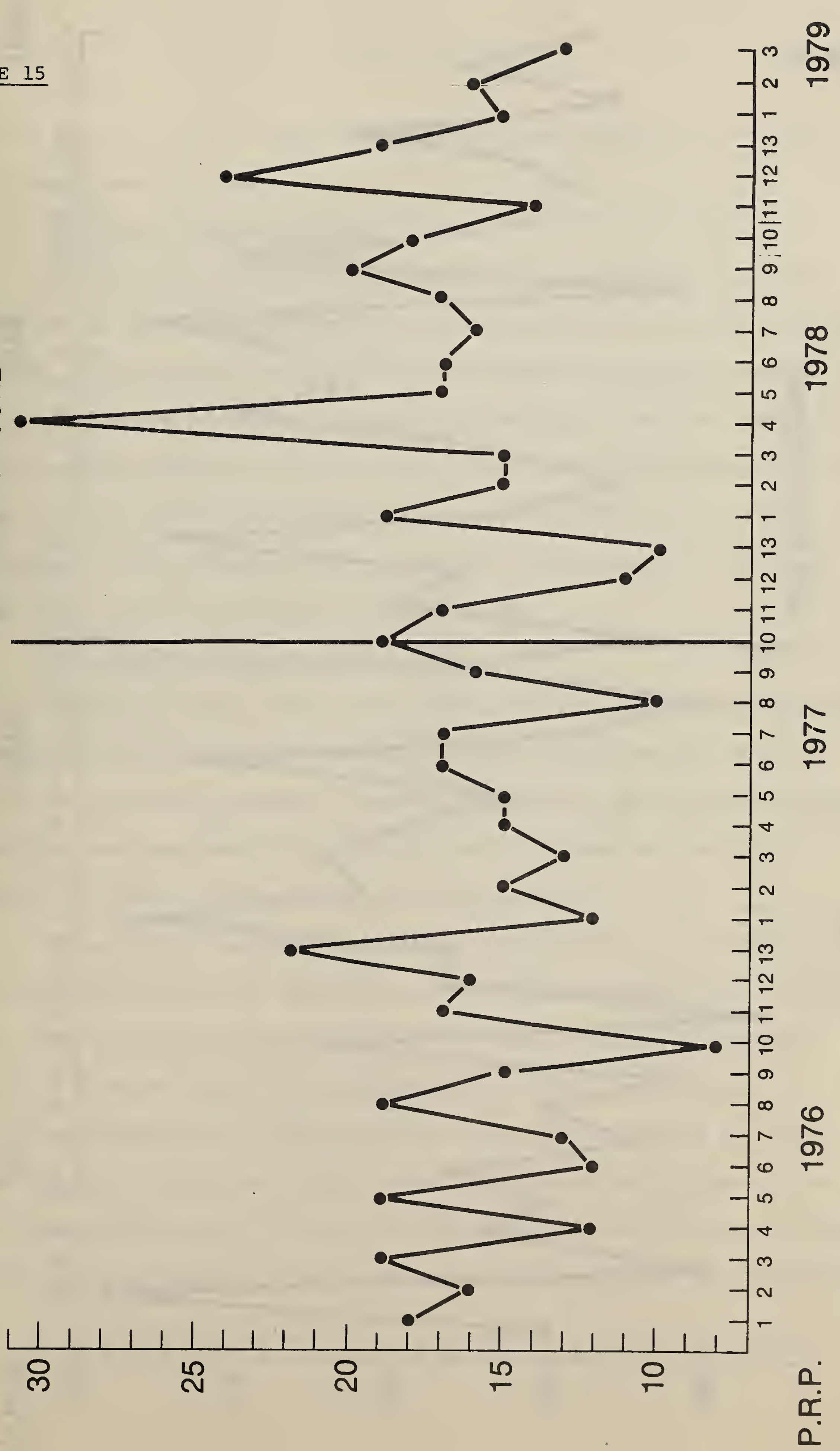
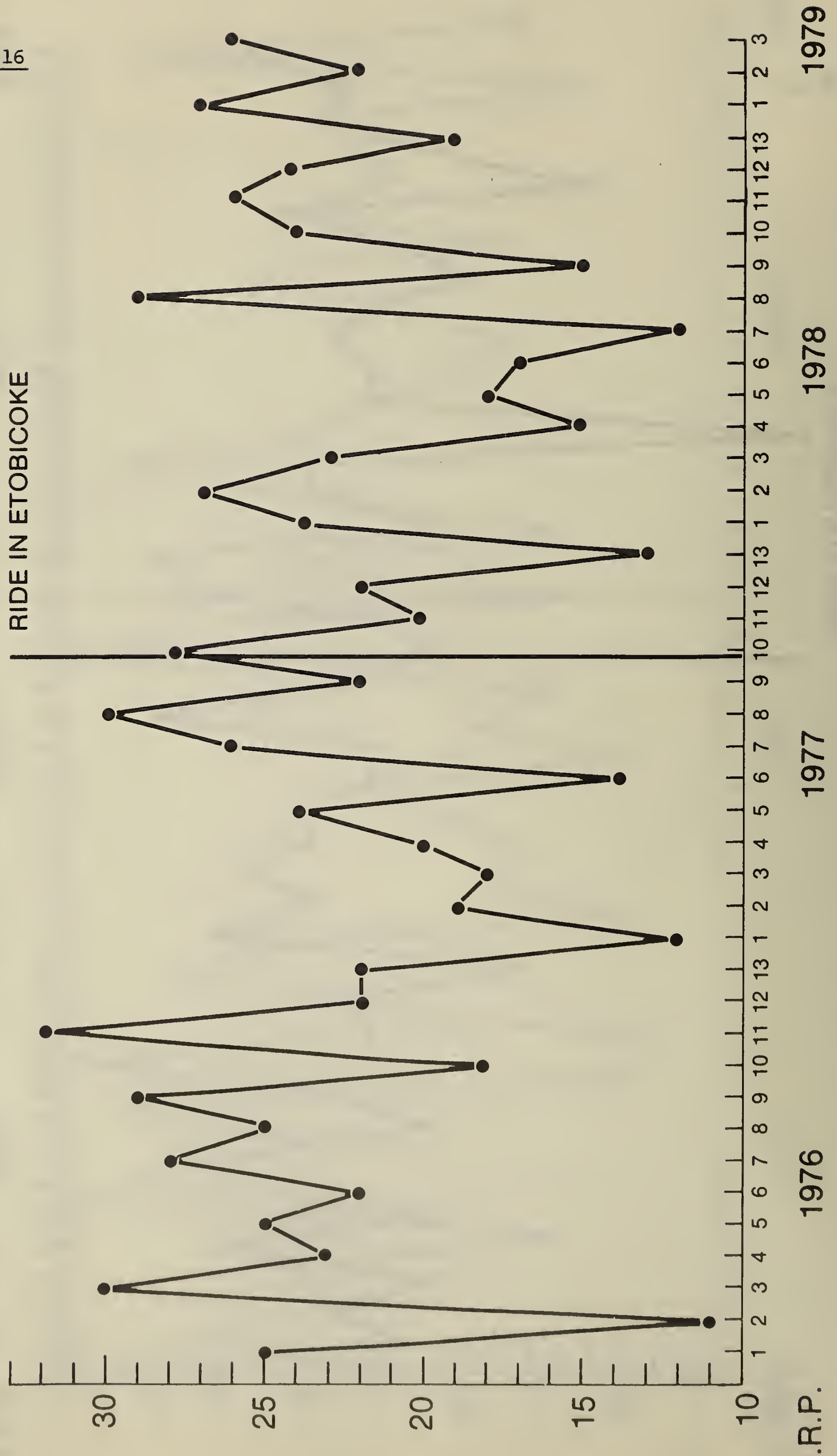


FIGURE 16



PERSONS INJURED IN "ALCOHOL-RELATED" ACCIDENTS IN DISTRICT 5 district 4 (t = .37, p >.05, level change = -1.16) and district 5 (t = .92, p >.05, level change = -4.69).

Proportion of Total Injuries

The data for proportion of injuries that are considered "alcohol-related" for all five districts for the six-month extension are given in Table 13 and for the years 1976-1979 are pictorially represented in Figures 17 to 21. The data from 1972 to April 1979 were subjected to Time Series Analyses. No significant trends were found for district 1 (t = .72, p >.05, level change = -.70), district 2 (t = 1.48, p >.05, level change = -1.47), district 3 (t = .36, p >.05, level change = -.33), district 4 (t = .04, p >.05, level change = -.05), and district 5 (t = 1.02, p >.05, level change = -1.03).

Additional Postfactum Accident Data

Through the course of R.I.D.E. numerous groups, particularly the police, have suggested that changes were occurring in other traffic control areas, as a result of the spot-check programme. Specifically, police officers were suggesting that Etobicoke residents were drinking outside of Etobicoke and using the highways to get home as they were not spot-check enforced. So need [illegible]

Additionally, the police and others were suggesting that people were now drinking more on the Peel region side of the "Airport Strip". The "alcohol-related" accident rate was suspected to have increased in Peel, the western neighbour of Etobicoke, since the introduction of R.I.D.E. in Etobicoke. or [illegible]

Consequently, two additional sets of data were collected post facto. Data for the O.P.P. patrolled highway strips of the Etobicoke sections of the Queen Elizabeth Way (Q.E.W.), Highway 401 and Highway 427 and the Toronto section of Highway 401 were obtained from the Ministry of Transportation and Communications.

TABLE 13

PROPORTIONS OF PERSONS INJURED IN "ALCOHOL-RELATED ACCIDENTS BY DISTRICT AND POLICE REPORTING PERIOD FOR SEPTEMBER 1978 - APRIL 1979

YEAR PRP	DISTRICT					
	1	2	3	4	5	TOTAL
1978						
11	4.67	7.39	5.05	8.44	6.10	6.21
12	5.06	5.39	4.13	8.82	5.31	5.59
13	5.46	2.37	4.28	6.64	5.20	4.90
1979						
1	4.47	7.73	2.16	5.12	6.82	5.04
2	5.45	6.66	5.54	6.37	5.31	5.74
3	4.62	7.92	2.98	5.46	7.30	5.50
4	5.02	6.92	4.53	6.20	6.61	5.80

FIGURE 17

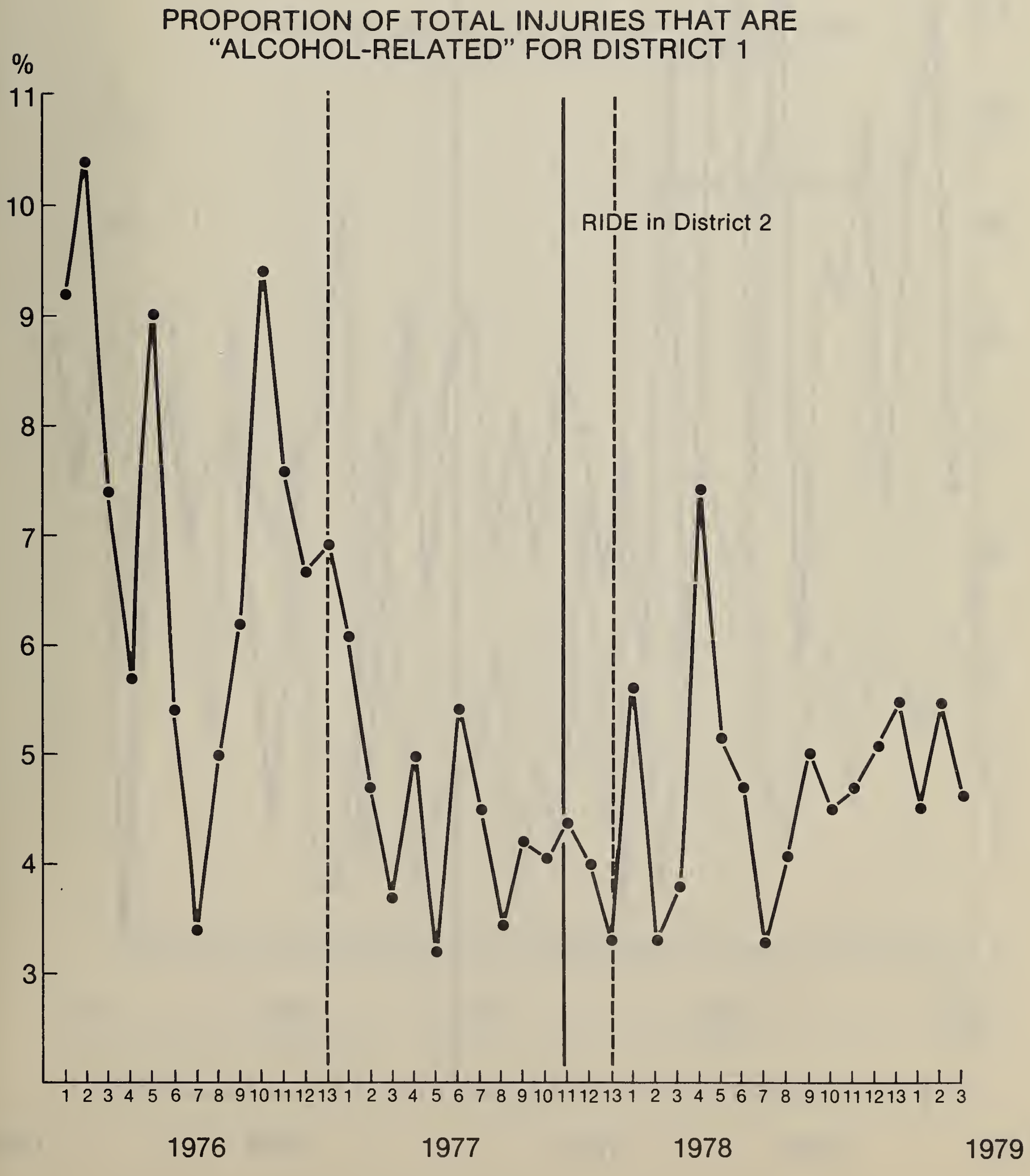

PROPORTION OF TOTAL INJURIES THAT ARE "ALCOHOL-RELATED" FOR DISTRICT 1
%
11
10
9
8
7
6
5
4
3
RIDE in District 2
1 2 3 4 5 6 7 8 9 10 11 12 13 1 2 3 4 5 6 7 8 9 10 11 12 13 1 2 3 4 5 6 7 8 9 10 11 12 13 1 2 3
1976
1977
1978
1979

FIGURE 18

PROPORTION OF TOTAL INJURIES THAT ARE "ALCOHOL-RELATED" IN DISTRICT 2

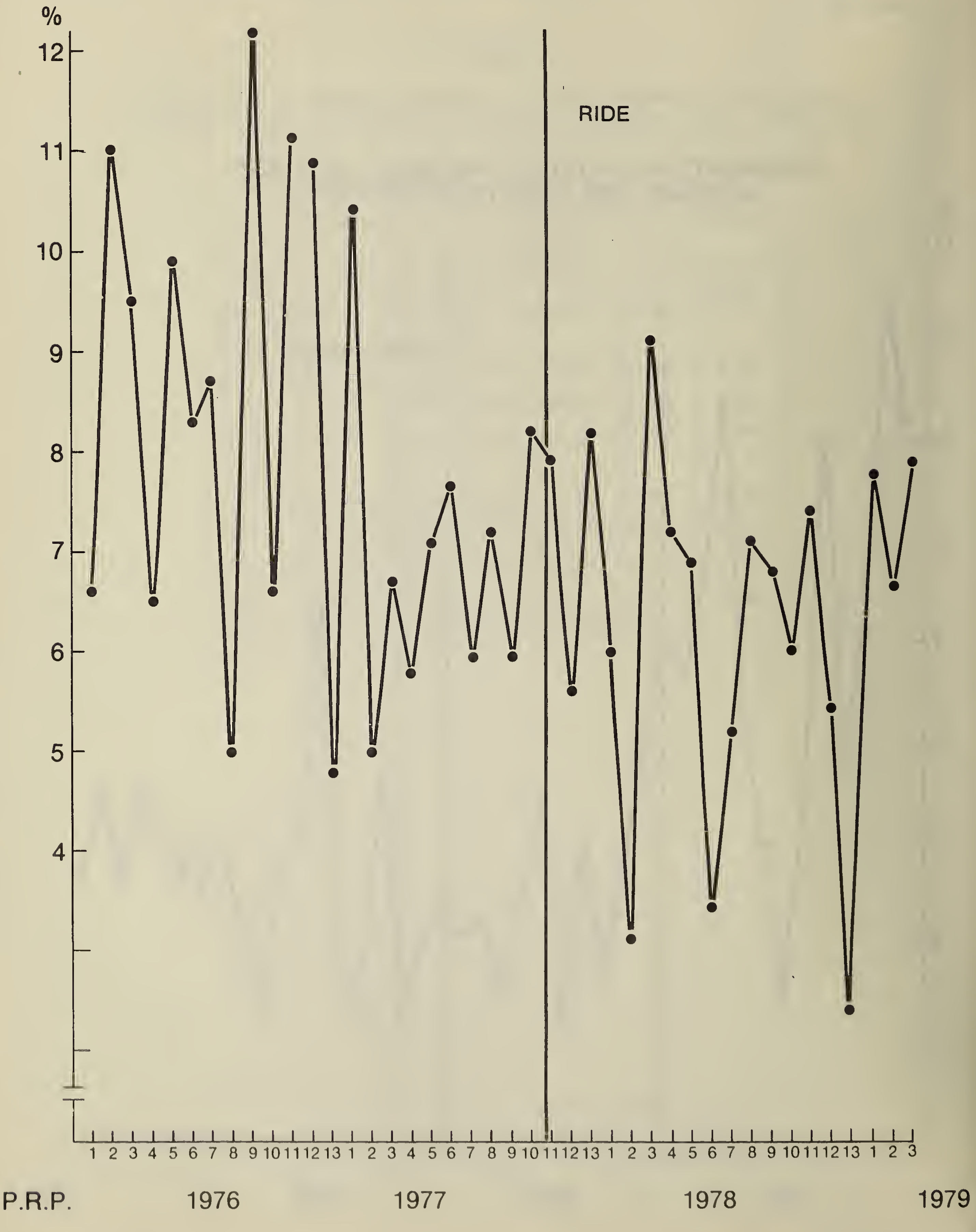


FIGURE 19

PROPORTION OF TOTAL INJURIES THAT ARE "ALCOHOL-RELATED" IN DISTRICT 3

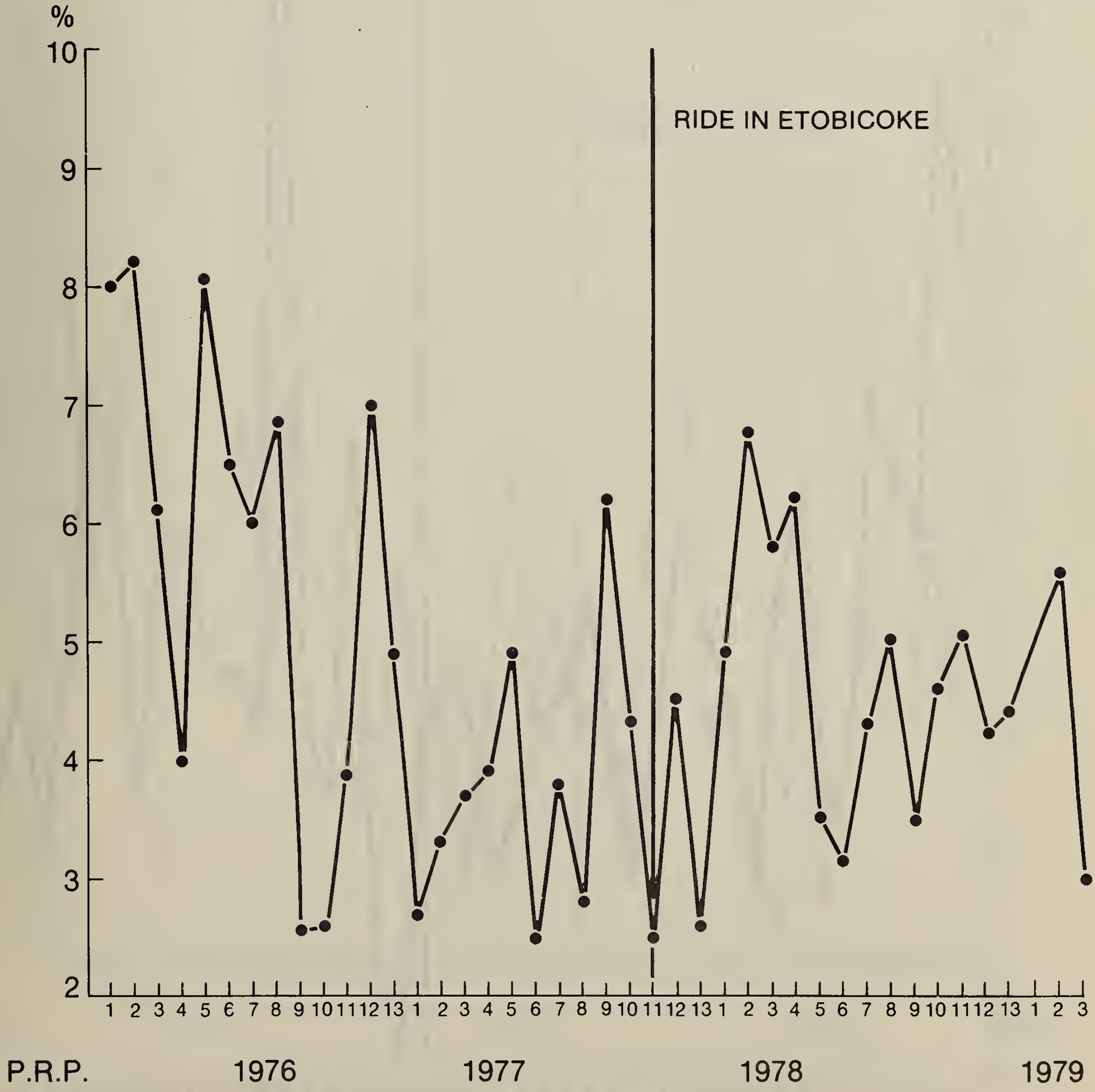


FIGURE 20

PROPORTION OF TOTAL INJURIES THAT ARE "ALCOHOL-RELATED IN DISTRICT 4

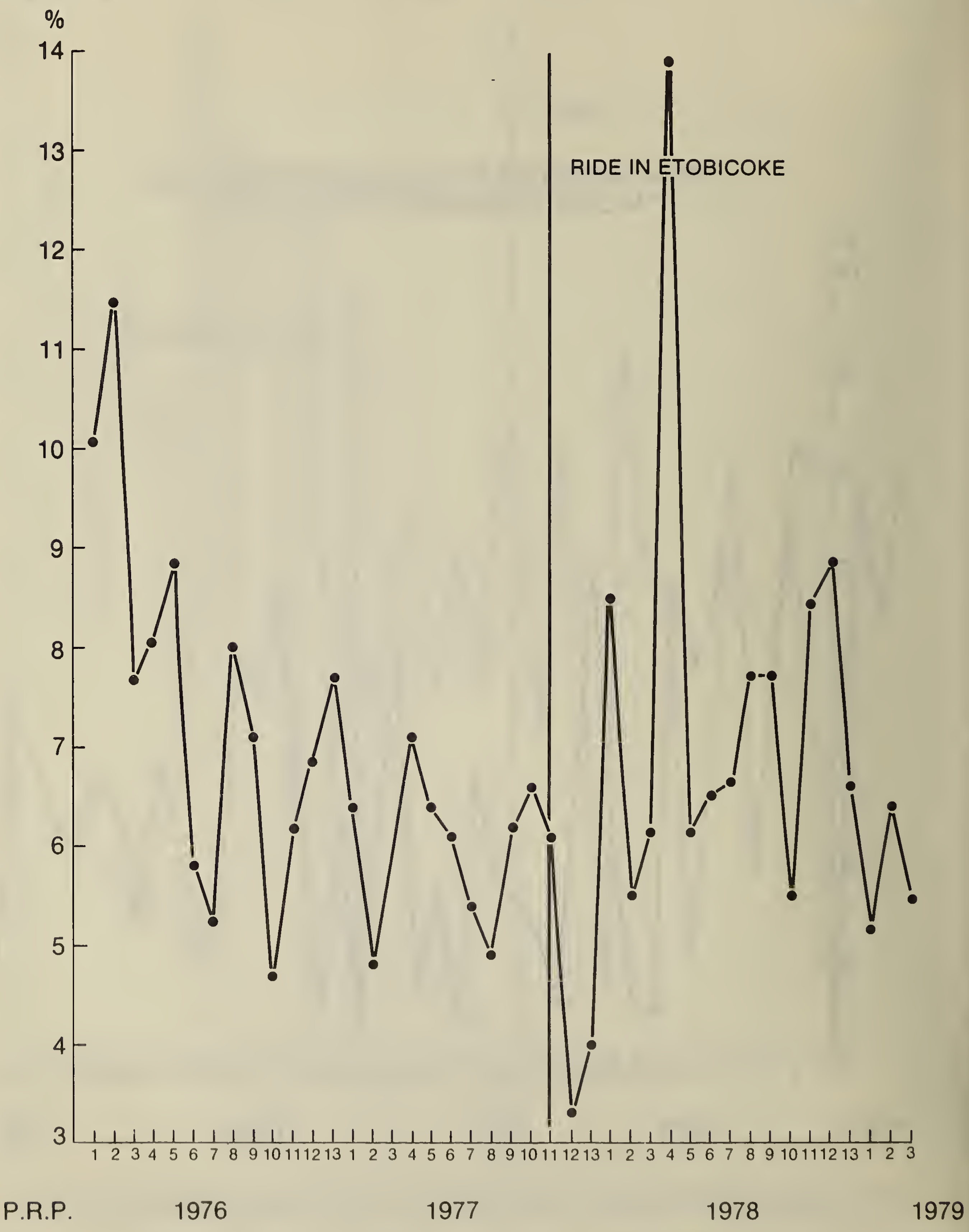
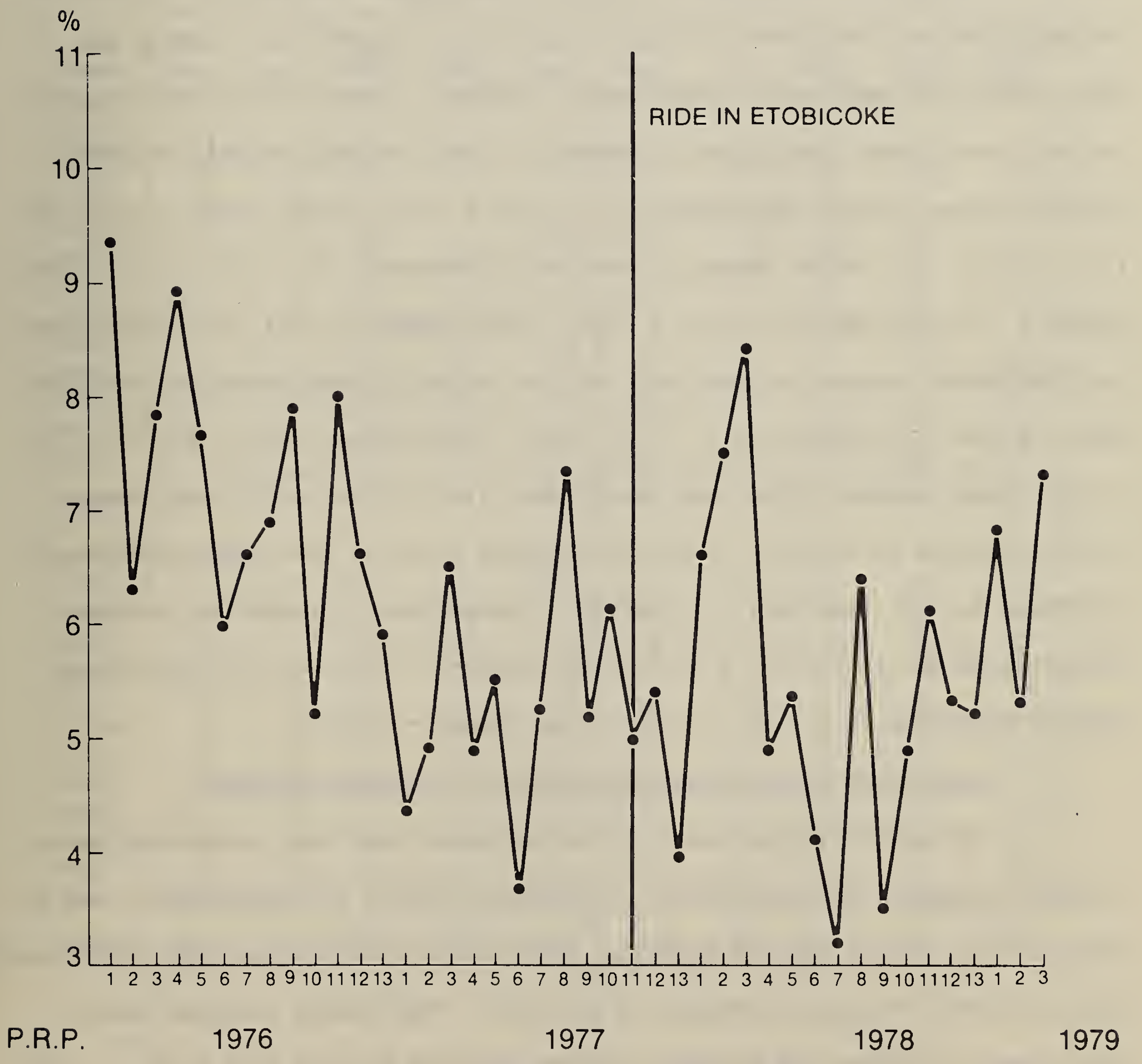


FIGURE 21

PROPORTION OF TOTAL INJURIES THAT ARE "ALCOHOL-RELATED" IN DISTRICT 5



Data on accidents were also gathered from the Peel Regional Police Department.

Highway "Alcohol-Related" Accidents

The monthly figures for O.P.P. reported "alcohol-related" accidents for Q.E.W. (Etobicoke), 427, 401 (Etobicoke), sum (Q.E.W. (Etobicoke) + 427 + 401 (Etobicoke)) and 401 (Toronto), for Sunday through Wednesday and Thursday through Saturday from January 1973 to March 1979, are offered in Table 14. These data were subjected to Time Series Analyses. Three of the four measures in Etobicoke showed significant increases for the Thursday through Saturday accident rates, Q.E.W. (Etobicoke) ($t = 2.34$, $p < .05$, level change $= .91$), 427 ($t = 2.62$, $p < .01$, level change $= .68$), 401 (Etobicoke) ($t = .53$, $p > .05$, level change $= .21$) and sum ($t = 2.44$, $p < .05$, level change $= 1.77$), while there were no significant changes in Etobicoke for the Sunday through Wednesday accident rates, Q.E.W. (Etobicoke) ($t = .19$, $p > .05$, level change $= .06$), 427 ($t = .72$, $p > .05$, level change $= .19$), 401 (Etobicoke) ($t = .41$, $p > .05$, level change $= .15$), and sum ($t = .67$, $p > .05$, level change $= .40$). The "alcohol-related" accidents for 401 (Toronto) also showed a significant increase for Thursday through Saturday ($t = 3.22$, $p < .01$, level change $= 3.91$), but not for Sunday through Wednesday ($t = 1.15$, $p > .05$, level change $= 1.19$).

Proportion of Total Accidents That Are "Alcohol-Related"

The monthly proportions of all accidents that were considered to be "alcohol- related" for sum (Q.E.W. (Etobicoke) + 427 + 401 (Etobicoke)) and 401 (Toronto) for Sunday through Wednesday and Thrusday through Saturday from January 1973 to March 1979, are presented in Table 15. Time Series Analyses found significant increases for Thursday through Saturday for sum ($t = 3.26$, $p < .01$, level change $= .84$) and 401 (Toronto) ($t = 2.88$, $p < .01$, level change $= .41$)

TABLE 14

MONTHLY TOTALS OF "ALCOHOL-RELATED" ACCIDENTS FOR ETOBICOKE AND METRO HIGHWAYS FOR SUNDAY-WEDNESDAY AND THURSDAY-SATURDAY FROM JANUARY 1973 TO MARCH 1979

YEAR MONTH	SUNDAY - WEDNESDAY					THURSDAY - SATURDAY				
	401 ETOB.	427	QEW ETOB.	TOTAL	401 TOR.	401 ETOB.	427	QEW ETOB.	TOTAL	401 TOR.
1973										
Jan.	2	3	1	6	7	1	1	3	5	3
Feb.	1	1	3	5	4	4	0	1	5	9
Mar.	1	0	1	2	5	6	0	5	11	11
Apr.	2	1	4	7	6	3	1	0	4	9
May	2	0	0	2	6	1	0	0	1	6
June	1	1	1	3	8	2	1	1	4	5
July	0	0	2	2	6	0	2	0	2	5
Aug.	1	0	5	6	4	3	1	1	5	6
Sept.	1	1	3	5	4	3	0	1	4	6
Oct.	4	2	1	7	7	1	0	2	3	11
Nov.	0	0	2	2	3	2	2	2	6	12
Dec.	5	0	2	7	11	4	1	5	10	9
Total	20	9	25	54	71	30	9	21	60	92
1974										
Jan.	2	0	2	4	12	1	3	2	6	8
Feb.	1	2	1	4	4	2	1	1	4	8
Mar.	3	1	1	5	9	4	0	2	6	6
Apr.	1	1	0	2	5	1	2	4	7	9
May	0	0	1	1	5	0	1	1	2	6
June	2	0	2	4	6	1	2	4	7	8
July	2	1	1	4	6	1	1	2	4	2
Aug.	2	2	3	7	2	2	2	1	5	9
Sept.	3	1	2	6	5	5	0	1	6	8
Oct.	0	0	3	3	7	4	1	1	6	11
Nov.	3	0	3	6	11	3	4	3	10	10
Dec.	8	2	3	13	14	5	1	2	8	9
Total	27	10	22	59	86	29	18	24	71	94

TABLE 14 continued

YEAR MONTH	SUNDAY - WEDNESDAY					THURSDAY - SATURDAY				
	401 ETOB.	427	QEW ETOB.	TOTAL	401 TOR.	401 ETOB.	427	QEW ETOB.	TOTAL	401 TOR.
1975										
Jan.	2	0	1	3	11	2	0	3	5	9
Feb.	5	4	1	11	13	0	3	1	4	7
Mar.	0	0	2	2	7	6	0	2	8	8
Apr.	1	0	1	2	6	1	0	1	2	8
May	3	1	3	7	4	2	1	0	3	10
June	1	1	0	2	10	0	2	0	2	6
July	1	1	1	3	8	2	0	1	3	3
Aug.	2	0	0	2	7	1	2	0	3	7
Sept.	2	0	0	2	4	3	2	1	6	7
Oct.	1	0	0	1	10	4	2	1	7	6
Nov.	4	0	3	7	13	1	0	0	1	9
Dec.	4	2	0	6	16	1	3	0	4	8
Total	26	9	13	48	109	23	15	10	48	88
1976										
Jan.	1	2	1	4	6	3	3	1	7	8
Feb.	3	2	1	6	5	0	2	4	6	2
Mar.	1	2	0	3	9	1	0	1	2	9
Apr.	1	0	2	3	3	2	0	1	3	11
May	3	1	1	5	2	1	1	0	2	6
June	2	0	0	2	4	0	0	0	0	7
July	0	2	1	3	5	1	1	1	3	8
Aug.	2	0	1	3	5	1	1	0	2	4
Sept.	0	0	1	1	1	0	0	1	1	7
Oct.	3	0	2	5	4	1	2	1	4	9
Nov.	2	0	0	2	8	2	1	1	4	8
Dec.	1	2	2	5	10	6	1	3	10	14
Total	19	11	12	42	62	18	12	14	44	93

TABLE 14 continued

	SUNDAY - WEDNESDAY					THURSDAY - SATURDAY				
YEAR MONTH	401 ETOB.	427	QEW ETOB.	TOTAL	401 TOR.	401 ETOB.	427	QEW ETOB.	TOTAL	401 TOR.
1977										
Jan.	2	1	0	3	9	1	1	1	3	14
Feb.	1	4	2	7	6	2	0	3	5	13
Mar.	0	1	0	1	7	1	0	0	1	3
Apr.	2	1	2	5	6	7	2	1	10	5
May	1	0	1	2	6	0	0	0	0	5
June	0	3	1	4	13	2	0	0	2	3
July	2	0	1	3	1	1	1	4	6	8
Aug.	2	0	2	4	6	3	0	0	3	10
Sept.	0	0	1	1	5	1	3	0	4	9
Oct.	3	2	0	5	5	2	1	3	6	6
Nov.	1	1	2	4	11	2	0	1	3	5
Dec.	3	1	1	5	6	4	2	3	9	10
Total	17	14	13	44	81	26	10	16	52	91
1978										
Jan.	2	2	2	6	17	2	1	2	5	16
Feb.	2	0	1	3	3	2	1	2	5	14
Mar.	2	0	0	2	8	2	3	4	9	10
Apr.	0	0	0	0	7	2	4	6	12	10
May	3	2	2	7	7	3	0	0	3	8
June	3	1	0	4	5	2	0	1	3	14
July	3	0	2	5	8	2	4	0	6	5
Aug.	1	0	3	4	7	4	1	4	9	2
Sept.	1	1	2	4	10	1	3	2	6	12
Oct.	1	2	0	3	5	3	2	3	8	18
Nov.	1	3	2	6	5	2	0	1	3	14
Dec.	5	1	4	10	4	3	1	2	6	16
Total	24	12	18	54	86	28	20	27	75	139
1979										
Jan.	3	1	1	5	14	0	3	1	4	26
Feb.	1	1	2	4	13	4	3	1	8	9
Mar.	0	1	3	4	9	1	2	5	8	14
Total	4	3	6	13	36	5	8	7	20	49

TABLE 15

MONTHLY PROPORTIONS OF "ALCOHOL-RELATED" ACCIDENTS ON ETOBICOKE (401 + 427 + QEW) AND TORONTO 401

MONTH /DAYS	1973		1974		1975		1976		1977		1978		1979	
	ETOB.	METRO	ETOB.	METRO	ETOB.	METRO	ETOB.	METRO	ETOB.	METRO	ETOB.	METRO	ETOB.	METRO
Jan. 1*	10.17	4.61	5.06	6.52	5.89	11.83	2.40	2.66	2.68	4.69	4.28	8.72	4.72	11.29
Jan. 2+	8.62	3.95	5.67	5.67	5.00	4.59	6.09	6.02	3.16	8.43	5.32	7.55	4.88	8.44
Feb. 1	6.67	2.70	4.12	2.99	8.33	8.02	13.64	7.81	7.87	4.03	4.54	3.89	3.15	6.77
Feb. 2	7.35	9.18	5.33	8.60	6.56	8.14	16.67	4.17	10.64	20.00	7.94	12.50	19.51	15.52
Mar. 1	3.33	6.10	6.33	8.91	5.56	8.05	4.29	5.39	2.27	7.22	4.65	12.12	6.78	11.54
Mar. 2	11.83	9.57	6.59	5.45	6.40	4.79	3.64	14.29	1.32	2.22	11.84	10.42	17.02	15.22
Apr. 1	11.48	7.06	2.53	5.75	3.77	7.23	6.52	4.69	15.15	13.33	0.00	9.33		
Apr. 2	6.56	9.57	15.22	11.84	1.83	6.25	7.89	16.67	16.67	6.76	30.77	16.95		
May 1	2.82	4.44	0.95	5.32	11.29	5.80	8.20	2.56	4.88	7.41	11.66	7.22		
May 2	1.37	6.67	3.17	7.23	4.76	13.51	3.17	8.82	0.00	8.06	4.00	9.88		
June 1	4.62	7.34	5.48	7.79	4.00	8.62	4.00	4.88	12.50	13.83	5.55	4.46		
June 2	4.17	5.49	6.03	7.02	3.39	8.70	0.00	7.37	2.90	4.55	8.33	18.66		
July 1	2.33	6.12	4.00	6.74	5.77	9.30	4.92	6.94	4.62	1.39	6.41	6.72		
July 2	2.99	6.02	6.78	3.08	4.23	4.05	3.80	6.20	13.04	9.20	14.29	7.57		
Aug. 1	8.22	4.55	10.00	3.45	2.90	6.93	5.66	5.62	4.35	4.32	4.49	6.60		
Aug. 2	5.26	5.56	4.55	6.98	4.69	5.65	3.23	4.35	7.14	14.29	21.95	4.00		
Sept 1	8.20	4.12	7.32	6.41	3.92	6.90	1.85	1.14	1.50	5.56	6.35	8.33		
Sept 2	7.14	5.31	9.38	10.00	8.82	6.09	1.49	6.73	4.82	7.38	9.84	11.32		
Oct. 1	5.51	4.79	4.23	8.43	1.82	9.52	8.93	4.88	10.64	5.75	5.36	4.35		
Oct. 2	3.70	10.68	10.00	12.09	11.30	7.70	5.71	10.00	8.45	4.72	11.59	19.56		
Nov. 1	3.45	3.85	6.45	11.83	6.54	13.68	2.82	8.70	4.65	6.67	4.58	2.59		
Nov. 2	6.00	10.81	11.63	10.00	1.01	8.82	7.02	10.67	6.38	5.81	6.82	18.66		
Dec. 1	6.80	7.75	15.85	10.07	3.47	5.84	4.27	6.06	3.36	2.14	14.08	2.60		
Dec. 2	8.77	6.57	10.00	7.83	2.65	4.12	7.30	8.64	14.06	10.80	7.32	12.69		
Average	6.14	6.37	6.94	7.50	5.16	7.67	5.56	6.89	6.79	7.44	8.83	9.45	9.34	11.46

* 1 = Sunday - Wednesday

+ 2 = Thursday - Saturday

but no significant changes for Sunday through Wednesday for sum ($t = .87$, $p > .05$, level change = -.15) and 401 (Toronto) ($t = .15$, $p > .05$, level change = .02).

Peel Regional "Alcohol-Related" Accidents

Monthly "alcohol-related" accident figures for 1976 to 1978 were also gathered from the three police divisions (11, 12, 21) of Peel Region, the western flanking neighbour of Etobicoke and are presented in Table 16. These data were subjected to autocorrelation analyses. The autocorrelations were too low and t-tests were subsequently performed. It is important to point out here that the number of observations for Peel region failed to meet the basic number of observations required by Time Series Analysis. Thus, caution must be exercised in interpretation of these results.

The data for each division and the sum of all three divisions were analyzed. Significant increases were found for division 21 ($t = 2.54$, $df = 19.96$, $p < .05$) and the total for all three divisions ($t = 2.11$, $df = 34$, $p < .05$). However, no significant differences were present for divisions 11 ($t = 1.02$, $df = 34$, $p > .05$) and 12 ($t = .83$, $df = 34$, $p > .05$).

Impaired Charges

Police data for the impaired charges laid in the five districts for the six-month extension are given in Table 17. The data from 1976 to April 1979 were subjected to autocorrelation analysis. Again, most likely because of the small sample size, dependency of scores was not found and t-tests were performed on the data. There were no significant differences for district 1 ($t = .77$, $df = 42$, $p > .05$), district 3 ($t = .92$, $df = 42$, $p > .05$) and district 5 ($t = .09$, $df = 42$, $p > .05$). Districts 2 and 4 showed significant increases in impaired

TABLE 16

MONTHLY TOTALS OF "ALCOHOL-RELATED" ACCIDENTS IN PEEL REGION FROM JANUARY 1976 TO DECEMBER 1978

YEAR DIV.	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	TOTAL
1976													
11	23	24	25	26	16	20	19	20	23	23	24	43	286
12	8	10	22	17	12	22	17	20	15	24	16	27	210
21	19	30	39	31	29	27	35	31	22	40	46	42	391
Total	50	64	86	74	57	69	71	71	60	87	86	112	887
1977													
11	18	18	19	21	21	20	23	24	29	37	29	27	286
12	18	10	18	15	20	18	18	17	14	21	17	25	211
21	29	26	30	34	28	32	33	30	34	38	48	53	415
Total	65	54	67	70	69	70	74	71	77	96	94	105	912
1978													
11	25	19	19	20	16	28	17	13	23	34	31	38	283
12	12	19	20	15	16	20	16	13	16	22	15	28	212
21	33	25	29	32	36	32	46	33	32	43	55	67	463
Total	70	63	68	67	68	80	79	59	71	99	101	133	958

TABLE 17

DRIVERS CHARGED WITH DRINKING-DRIVING OFFENCES

YEAR PRP	DISTRICT						
	1	2	*	3	4	5	TOTAL
1978							
11	204	139	113	154	141	320	958
12	174	137	107	141	170	248	870
13	177	114	88	123	127	229	770
1979							
1	127	112	88	85	93	192	609
2	183	137	102	123	154	229	826
3	212	163	112	152	159	273	959
4	180	134	82	135	141	249	839

* Estimated charges laid excluding those charged by R.I.D.E. crew.

charges laid for the R.I.D.E. intervention period, district 2 (t = 2.22, df = 42, $p < .05$) and district 4 (t = 2.54, df = 42, $p < .05$). However, when the impaired charges laid by the additional manpower of the R.I.D.E. spot-checks were removed, so that the impaired charges only reflected the drivers charged from routine patrolling of the regular police force, there was a significant decrease in the number of impaired charges laid (t = 3.63, df = 42, $p < .01$).

Blood Alcohol Levels

The blood alcohol levels (B.A.L.s) of those involved in collisions and those stopped for possible impaired driving (but not involved in a collision) for all five districts for the additional six month period (i.e. from October 1978 to April 1979) are presented in Tables 18 and 19 respectively.

Autocorrelation analyses were used on the 1976 to 1979 data for the five districts. The B.A.L.s of non-collision data for district 2 and the B.A.L.s of collision victims for districts 1 to 4 were too low to warrant Time Series Analysis. Simple t-tests were employed on these sets of data with the following results.

There was no significant difference for the B.A.L.s of the suspected impaired drivers for the pre-intervention and intervention period for district 2 (t = .73, df = 42, $p > .05$). Time Series Analyses for the other four districts yielded insignificant results, district 1 (t = 1.30, $p > .05$, level change = 3.52), district 4, (t = 1.02, $p > .05$, level change = 2.99), district 5 (t = .93, $p > .05$, level change = 5.45), although an almost significant downward trend was found for district 3 (t = 1.90, p = .057, level change = -12.8).

The t-tests on B.A.L.s for collision victims showed no significant differences for the pre-intervention and intervention data for district 1 (t = 1.51, df = 42, $p > .05$), district 2 (t = 1.33, df = 42, $p > .05$), district 3 (t = 1.23,

TABLE 18

MEAN B.A.L.s IN MGM OF DRIVERS INVOLVED IN COLLISIONS

YEAR PRP	DISTRICT 1	2	3	4	5
1978					
11	168.0	155.0	167.0	167.0	163.0
12	178.0	175.0	151.0	168.0	164.0
13	156.0	159.0	163.0	154.0	160.0
1979					
1	185.0	177.0	172.0	153.0	176.0
2	162.0	159.0	179.0	173.0	163.0
3	152.0	146.0	166.0	164.0	155.0

TABLE 19

MEAN B.A.L.s. IN MGM OF DRIVERS NOT INVOLVED IN COLLISION

YEAR PRP	DISTRICT				
	1	2	3	4	5
1978					
11	158.0	147.0	149.0	159.0	160.0
12	157.0	156.0	149.0	154.0	169.0
13	157.0	146.0	150.0	153.0	157.0
1979					
1	154.0	159.0	160.0	146.0	152.0
2	167.0	153.0	147.0	163.0	158.0
3	165.0	163.0	154.0	158.0	155.0

df = 43, $p > .05$) and district 4 ($t = 1.63$, df = 42, $p > .05$). Time Series Analysis for district 5 showed a significantly increasing trend for B.A.L.s for the intervention period when compared to the pre-intervention period ($t = 2.74$, $p < .01$, level change = 8.84).

Independent Roadside Survey

The best measure of changes in impaired driving as a function of an intervention is a random roadside breath alcohol level survey with experimental and control groups, pre and post intervention phases. Unfortunately, because of time and expense this enterprise was not undertaken. However, Etobicoke and Toronto were surveyed as part of a national roadside survey in April 1974 and provincial roadside survey in April 1979. Although the sample sizes from the 1974 survey in particular, are small and the five year span is too long to be considered an effective baseline pre-intervention measure in support of a causal model, it was hoped that the survey would be useful in estimating the number of drinking drivers on the road in Etobicoke and Toronto and in elucidating possible trends, changes and differences among the districts. The questionnaire of the 1979 survey included the borough of residence for all cars stopped in the Toronto area (Interministerial Committee on Drinking Driving, 1980).

Results

Thirty-two sites were surveyed in 1974 and repeated in 1979 with 8 sites in Etobicoke, 8 sites in district 1, 8 sites in district 5 and the remaining 8 sites in districts 3 and 4. Data were analyzed for the 8 sites in each of districts 1, 2 (Etobicoke) and 5. The B.A.L.s of the drivers interviewed for the three districts for 1974 and 1979 are given in Tables 20 and 21, respectively.

TABLE 20

B.A.L.s OF DRIVERS STOPPED IN TORONTO IN THE 1974 ROADSIDE SURVEY

B.A.L.s IN MGM	DISTRICT					
	1		2 (ETOB.)		5	
	N	%	N	%	N	%
0 - 49	129	(91.5)	108	(93.1)	122	(89.1)
50 - 79	8	(5.7)	3	(2.6)	9	(6.6)
80 +	4	(2.8)	5	(4.3)	6	(4.3)
Total	141	(100.0)	116	(100.0)	137	(100.0)

TABLE 21

B.A.L.s OF DRIVERS STOPPED IN TORONTO IN THE 1979 ROADSIDE SURVEY

B.A.L.s IN MGM	DISTRICT					
	1		2 (ETOB.)		5	
	N	%	N	%	N	%
0 - 49	356	(88.4)	242	(87.0)	238	(89.2)
50 - 79	26	(6.5)	19	(6.8)	14	(5.2)
80 +	21	(5.2)	17	(6.1)	15	(5.6)
Total	403	(100.0)	278	(100.0)	267	(100.0)

Log-linear analyses of the three-way contingency tables were performed, in which models were tested for the minimum set of interaction effects which could account for the observed data (Davis, 1974).

No significant main effects or interactions were found for year or district.

In addition, the B.A.L.s of 1979 drivers stopped in Toronto by borough of residence is presented in Table 22. No significant differences were found, although there was a slight tendency for Etobicoke residents to be the smallest proportion of impaired drivers on the road.

The B.A.L.s of drivers stopped at sites outside of their borough of residence were also investigated. Table 23 presents the B.A.L.s of drivers stopped in Etobicoke and Central Toronto (districts 1 and 5) according to their borough of residence. Although the number of non-Etobicoke residents driving in Etobicoke is small, a significantly greater proportion of non-Etobicoke residents had B.A.L.s over the legal limit ($\chi^2 = 8.90$, $df = 1$, $p < .01$), than the Etobicoke residents driving in their own borough. There were no significant differences between central Toronto residents and non-central Toronto residents stopped in central Toronto.

Public Education Component of R.I.D.E.

An education campaign also accompanied the R.I.D.E. spot-checks as a means of increasing the public's knowledge of drinking-driving and risk perception. Newspapers, magazines and electronic media were the primary methods for publicizing the programme. There was no paid advertising except for a R.I.D.E. pamphlet that was distributed through police spot-checks and various other channels. During the year and a half operation of the R.I.D.E., over 200 items

TABLE 22

B.A.L.s OF DRIVERS STOPPED AT TORONTO SITES BY BOROUGH OF RESIDENCE

B.A.L.s IN MGM	CENTRAL TORONTO N	CENTRAL TORONTO %	ETOBICOKE N	ETOBICOKE %	NORTH YORK N	NORTH YORK %	SCARBORO. N	SCARBORO. %	MISSING DATA N	MISSING DATA %
0 - 50	471	84.0	177	87.6	127	84.1	42	84.0	21	95.4
51 - 80	31	5.5	13	6.4	8	5.3	2	4.0	0	0.0
80 +	25	4.4	7	3.5	10	6.6	3	6.0	1	4.5
Refused	34	6.1	5	2.5	6	4.0	3	6.0	0	0.0
Total	561	100.0	202	100.0	151	100.0	50	100.0	22	100.0
≤ 80	502	95.3	190	96.4	135	93.1	44	93.6		
> 80	25	4.7	7	3.6	10	6.9	3	6.4		
Total	527	100.0	197	100.0	145	100.0	47	100.0		

TABLE 23

B.A.L.s OF DRIVERS STOPPED AT ETOBICOKE SITES BY BOROUGH OF RESIDENCE

B.A.L.s IN MGM	ETOBICOKE		TORONTO EXCLUDING ETOBICOKE	
	N	%	N	%
≤ 80	165	97.0	53	86.9
> 80	5	3.0	8	13.1
Total	170	100.0	61	100.0

TABLE 23

B.A.L.s. OF DRIVERS STOPPED AT CENTRAL TORONTO SITES BY BOROUGH OF RESIDENCE

B.A.L.s IN MGM	CENTRAL TORONTO		NORTH YORK AND SCARBOROUGH	
	N	%	N	%
≤ 80	416	96.3	140	94.0
> 80	16	3.7	9	6.0
Total	432	100.0	149	100.0

have appeared in the printed media alone. Nield (1980) provides a detailed overview of the education campaign.

The evaluation of the efficacy of the education campaign is available in the previous R.I.D.E. report (Vingilis, Salutin and Chan, 1979).

Summary of Results

The accident statistics showed varying trends during the R.I.D.E intervention period. The following section presents a tabular depiction of the trends:

Districts	1	2	3	4	5
"alcohol-related" accidents	$p < .01$↓	$p < .1$↓	N.S.-	$p < .001$↑	N.S.-
proportion of total accidents considered "alcohol-related"	N.S.-	$p < .1$↓	N.S.-	N.S.-	N.S.-
"alcohol-related" injuries	N.S.-	N.S.-	N.S.-	N.S.-	N.S.-
proportion of total injuries considered "alcohol-related"	N.S.-	N.S.-	N.S.-	N.S.-	N.S.-
impaired charges (with R.I.D.E. charges)	N.S.-	$p < .01$↑	N.S.-	N.S.-	N.S.-
impaired charges (without R.I.D.E. charges)	N.S.-	$p < .01$↓	N.S.-	N.S.-	N.S.-
BALs of impaired driving suspects	N.S.-	N.S.-	$p < .06$↓	N.S.-	N.S.-
BALs of accident victims	N.S.-	N.S.-	N.S.-	N.S.-	$p < .01$↑

N.S. = not significant

Data for the "alcohol-related" accidents on the highways demonstrated significant increases for the Thursday through Saturday accident rates for Q.E.W. (Etob.), 427, sum (Q.E.W. (Etob.) + 427 + 401 (Etob.)) and 401 (Tor.), but not for 401 (Etob.). No differences were found for Sunday through Wednesday accident rates. The proportion of total accidents considered "alcohol-related" also showed significant increases for sum (Q.E.W. (Etob.) + 427 + 401 (Etob.)) for Thursday through Saturday but not for Sunday through Wednesday.

Significant increases were found for "alcohol-related" accidents for one of the three Peel police divisions and for the total of all three divisions.

The independent roadside survey showed that year and district had no effect on B.A.L.s.

Discussion

The results obtained from the R.I.D.E. programme are mixed. This makes the evaluation of the programme extremely difficult. From the final analyses of the data, there does not seem to be any absolutely conclusive evidence in support of the total success or failure of R.I.D.E. The data can only be said to suggest some positive indicators.

From the positive standpoint, none of the data for Etobicoke is contrary to the expected direction. The "alcohol-related" accidents and proportion of total accidents considered to be "alcohol-related" showed a nearly significant downward trend seemingly to be related to the intervention.

In addition, the number of impaired charges laid by regular police officers in Etobicoke were significantly lower during the intervention period than before R.I.D.E.

However, from the negative viewpoint, there are both major methodological weaknesses in the evaluation, (which have been discussed extensively in the one-year evaluation report), and many inconclusive results.

Many of the data show no changes as expected. There were no significant changes for any of the five districts for the "alcohol-related" injuries and proportion of all injuries considered "alcohol-related". No significant differences were found for Etobicoke in relation to the other four districts for the B.A.L.s of both suspected impaired drivers and suspected impaired accident victims. No significant changes were found in the B.A.L.s of drivers stopped by the independent roadside surveys either by year or district. Additionally, even though some data demonstrated changes, the exact interpretation of these data is questionable.

The "alcohol-related" statistics for Peel region indicated significant increases for division 21 (containing the "Airport Strip") and the sum total of all three divisions, but not for divisions 11 and 12 (bordering to the southwest of Etobicoke). These findings seem to support the contention that drinking has moved from Etobicoke to the Peel Region section of the "Airport Strip". However, given the tenuous nature of the hypothesis, and post factum analysis, caution must be exercised in making any definitive claims for the validation of the hypothesis.

Similarly, the post factum analyses of the highway data are difficult to interpret. The data indicated significant increases in "alcohol-related" accident rates for Toronto and most Etobicoke highways for Thursday through Saturday. This increase could be reflective of police officers' perceptions that drinking drivers are avoiding Etobicoke by using the non spot-checked highways. The 1979 Ontario roadside survey report does suggest that Thursday through Saturday are the prime drinking driving days, as opposed to Sunday through Wednesday. The significant increases, however, could also be reflective of other factors, such as traffic volume, or selective enforcement. Thus, the interpretation of these results is ambiguous.

These findings, in combination with the findings of the telephone surveys (documented in the one year report) offer positive indicators for the intermediate measures of increased knowledge on drinking driving, increased risk perception, and reduction in number of impaired charges laid by regular officers. Furthermore, there was an increase in the total number of impaired charges laid in Etobicoke by all officers which included the R.I.D.E. officers. These positive indicators may be considered to favour the merit of the R.I.D.E. programme, although by no means is there conclusive evidence in support of the criterion measures of a reduction in "alcohol-related" accidents and injuries or changes in B.A.L.s.

However, even in the absence of a proven ultimate effect, the reduction in impaired charges and changes in public knowledge showed the same pattern observed initially in Britain (Ross, 1972). Thus, the first three steps in the causal chain seem to have been somewhat successful, although there is no convincing evidence that the programme had any effect on traffic safety per se.

The ultimate change in "alcohol-related"accidents might not be in evidence because of contaminations mentioned previously (see Vingilis, Salutin, and Chung, 1979, for greater discussion of the contaminations), or because of the need of a longer intervention period or the links of the causal model may not be valid. It is clear, however, that valuable experience for further development of this type of programme and others has been gained from the R.I.D.E. pilot project.

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